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THE CANADIAN COLLEGE OF TEACHERS
Occasional Papers No. 1

CONTINUING PROFESSIONAL EDUCATION FOR SCHOOL TEACHERS AND ADMINISTRATORS

Alan B. Knox, Professor, College of Education, University of Wisconsin-Madison

The teaching- learning transaction is similar to the mobius strip (which is produced when one end of a strip of paper is given a half twist and attached to the other end). When you run your finger along the surface of the mobius strip, your finger is sometimes on the outside and sometimes on the inside.

Trying to put your finger on the improvement of teaching is like that too. Efforts to enhance learning soon turn to modification of teaching activities which are assessed by their impact on learning. The mobius quality of teaching is even more pronounced when a teacher is engaged in learning.

A desirable quality of teaching is enthusiasm for learning. Teachers who engage in continuing professional education activities evidence a commitment to lifelong learning for themselves as well as for other learners. This commitment is typically reflected in self directed learning activities. Such self directed learning projects, when combined with courses and workshops for teachers conducted by school districts, professional associations, and universities, constitute continuing professional education.

It is important to include learning projects because they are the core of professional development (Houle, 1980). Almost all professionals engage in numerous self directed learning projects each year, and they use various people and materials to assist them (Gross, 1977, Tough, 1978). The crucial feature of self directed learning is not the absence of guidance by another person but the presence of such guidance by the learner. This guidance includes recognition of needed improvement of performance, selection of learning activities that fit both this purpose and preferred learning style, and modification of learning activities based on an assessment of their usefulness. Fortunately, professionals can be

encouraged and assisted to become effective self directed learners (Knowles, 1975; Knox, 1974).

Use of self directed learning projects is one shared characteristic of continuing professional education in all fields. A more fundamental shared characteristic is the importance of understanding dynamics of adult development and learning, especially for members of professional occupations (Knox, 1977). Such dynamics include relatively high levels of learning ability as well as formal education, expectations regarding career development, encouragement by others of professional growth, adjustment to career changes, and sophistication in the use of learning procedures. A third shared characteristic is the desirability of using continuing education to advance more than a dozen aspects of professionalization (Houle, 1980). Examples include relating to students, solving problems by use of practical and theoretical knowledge and working with people in related occupations.

There are also some distinctive characteristics of continuing professional education for school teachers and administrators. One is the organizational setting in which they work as employees. Within that setting, teachers generally relate to each other in collegial ways and this is reflected in their continuing education activities. In that same setting, administrators' continuing education activities generally reflect hierarcical relationships (Houle, 1980). For all school personnel, continuing professional activities should support both personal career development and organizational productivity (Schein, 1978). Organizational influences on staff development also occurs for other professionals who work in large organizations, such as engineers.

Another distinctive characteristic of continuing education for school personnel is the pattern of occupational opportunities and constraints, especially at mid career. Typical school districts include mainly teachers, various specialists such as counselors, and a few administrators. Their students are usually children and adolescents, who can be sources of great satisfaction and great frustration. Such frustration and stress are compounded, especially at mid career for many school personnel, due to reverberations from unresolved parental relations when they were young. In addition, for many teachers, career advancement means competition for a small number of administrative positions.

The purpose of this paper is to provide an overview of concepts pertaining to planning and conducting continuing professional education for school teachers and administrators. The paper also identifies further readings to help school personnel strengthen professional development activities provided by school districts, professional associations, and universities. Reference is made to continuing education practices in other professional fields which could enrich staff development activities for educators.

Learning

A useful source of generalizations to strengthen professional development efforts is an understanding of adults (teachers, administrators) as learners (participants in continuing professional education activites). Such generalizations contribute to effective teaching of adult education courses, as well as conducting continuing professional education activities for themselves and for other educators (Knox, 1977).

Proficiency is a central concept regarding adult learning and teaching (Knox, 1980c). Proficiency is the capability to perform if given the opportunity. The discrepancy between current and desired proficiency creates educational needs. Career changes alert educators to such discrepancies and produce a heightened readiness to learn. Resultant learning activities by adults are typically efforts to enhance proficiency to improve performance. For example, teachers who effectively improve their teaching usually select manageable aspects on which to focus with an amount of time and effort they consider reasonable.

The interest that school teachers and administrators have in enhancing their proficiency encourages them to engage and persist in continuing professional education activities. Proficiencies change developmentally during adulthood. The concerns of the newly appointed teacher or administrator change greatly with five or six years of experience. Understanding of this developmental process entails recognizing the influence of past experience, the importance of maintaining stability in some parts of one's life when major changes are affecting other parts, and the power of a combination of personal striving and external encouragement.

Educators who actively seek to enhance their proficiencies tend to think of themselves as users of, instead of recipients of,

education. Planners of continuing professional education activities can help participants use education to clarify purposes and standards of excellence as well as to master procedures, and to select educational activities likely to serve their purposes. Those who conduct continuing professional education activities can encourage persistence by helping participants actively pursue their personal search for meaning, achieve consensus with participants regarding continuing education objectives, and apply what they learn to their professional role.

By involving participants in the planning process, they become more self directed as learners and more likely to use what they learn. Ways to do so include: providing self-assessment forms that enable participants to anonymously assess their own educational needs and evaluate their own progress, helping participants clarify and order their own education objectives within the scope of the program; and providing alternative materials and activities from which participants can select to fit their purposes and learning style.

A second central concept regarding adult learning and teaching is variation. Heterogeniety of adult backgrounds and expectations is a major finding of research on adult development and a major complaint of inexperienced teachers of adults. This variability also occurs for educators as learners. People become more different from each other over the years because of increasingly specialized life experiences.

Although variation in learning ability increases with age, almost all educators are able to learn almost anything they want, if they are willing to give the time and effort. Most continuing professional education participants are able learners as a result of ability, educational level, recency of educational activity and motivation to learn.

There is also variation in the influences on and reasons for participation in continuing professional education. Personal influences include reading habits, specialized interests, and satisfaction with current circumstances; situational influences include encouragement by others and accessible educational opportunities. Educators also vary in the barriers to learning that they confront.

Planners of continuing professional education can accommodate individual differences among educators as learners by individualization and assistance with self directed learning. Such accommodation can include use of sub groups, materials, and self directed learning projects. Planners can also utilize the experience and viewpoints of participants as resources for learning. Ways to accomplish this include demonstrations, participant presentations and panels, and focused discussion sessions.

Planning

Some concepts and procedures for helping adults learn have to do with teaching tasks entailed in planning and conducting continuing professional education activities (Knox, 1980a). Many useful program planning concepts are grouped in five components--needs, settings, objectives, activities and evaluation.

Effective continuing education seeks a match between participants' educational needs and subject matter content. There are many procedures for assessing educational needs of adults (Pennington, 1980). Included are: providing standards such as examples, self assessment inventories, or role models to help participants clarify desirable proficiencies; using tests and discussion to assess current proficiencies in order to increase relevance; and using program time for participants to explore desired proficiencies and contributions of continuing education activities.

The settings in which learning occurs and enhanced proficiency is applied also influences the educational process. Aspects of these settings include local purposes and resources such as continuing education offerings, available support services, continuing education delivery systems, and situational influences that affect application. Ways to identify major influences on staff development activities for educators include: having those who conduct the activity consider provider purposes and resources likely to influence meeting those needs, starting with a problem area in the school system and then attracting educators to plan and participate in an educational activity that is responsive to the problem, and using program time to help participants analyze facilitators and barriers that influence a problem and the solutions that are considered.

Information about needs and setting usually generates many potential educational objectives, from which to select those that are most desirable and feasible. The objective setting process should provide a clear and realistic description of desired proficiencies at the end of the program, and promote agreement among participants and resource persons regarding the main objectives. An emphasis on desired proficiency encourages going beyond information and facts and emphasizing higher level objectives such as major concepts, analysis, and attention to value judgements. Useful procedures for setting objectives include: using a planning committee that includes typical participants, resource persons, and a program coordinator; obtaining descriptions of successful practice to which participants aspire; and using reaction forms to ask participants to identify their objectives and related influences, as a basis for program modification.

Selection and organization of learning activities should help participants achieve objectives, including encouraging them to persist until objectives are achieved. Many types of learning activities (instructional methods) are available. Criteria for selecting appropriate methods include: types of proficiencies to be enhanced, fit with learner style and characteristics, encouraging persistence, and useful variety and sequence. Professionals should be helped to learn through instruction, inquiry, and performance (Houle, 1980). When lecture is used as a form of instruction, it is helpful to use language with immediacy and energy through powerful concepts, concrete examples, dramatic contrast, and supportive humor; and to be interactive by using questions to stimulate review, reinforce, relate, and apply the main ideas. When discussion is used as a form of inquiry, it is helpful to assure that participants have common experiences to provide a basis of exchange, and to provide a clear but flexible structure for the discussion, such as by using a developmental sequence of questions. When experiential learning is used it is helpful to decide on the type of performance to be improved and then select an appropriate form of experiential learning (such as video feedback from micro-teaching); and to help participants plan and implement a contract or arrangement for experiential learning (Blake and Mouton, 1978, Milton, 1978).

In continuing education, program evaluation consists of the various ways in which participants, resource persons, supervisors, and

policy makers make judgments based on evidence about the worth and effectiveness of the educational program in ways likely to contribute to program improvement and justification. Because of the great range of potential evaluation activities, those who coordinate the evaluation effort should select issues, procedures, and methods of reporting on which to focus. Illustrative evaluation procedures include: frequent evaluation review and feedback to aid learning by participants; reaction forms and brief interviews to assess participant satisfaction, observation of performance to ascertain the extent to which learning occurred and was applied; and use of organizational records and follow up interviews to evaluate program impact on participant performance and resultant benefits to the school system.

Conducting

The main benefit from deepened insights into adults as learners and program planning lies in the application of such concepts to the conducting of staff development activities. Concepts and procedures are useful to the extent to which they contribute to minute-by-minute experiences in the teaching-learning transaction. Especially during the first sessions of a continuing education program it is important to use such concepts to create a climate for learning that is supportive, friendly, spontaneous, informal, open, and challenging without being threatening or condescending. Ways to help participants become involved include setting a tone of informality and mutual respect; and arranging for introductions and other ways to help participants become acquainted such as encouraging them to say something about their backgrounds and reasons for participation.

Most continuing education programs consist of a series of sessions. Both within each session and across the series of sessions, it is important to sequence activities so there is progression and variety. In addition, participants' achievement and persistence depend on their perception of relevance of program content to their professional concerns, which can be achieved by early use of familiar and challenging examples, problems, and issues that help them recognize the importance of the topic as well as draw upon past experience. Ways to help participants relate new concepts to their current proficiencies include: use of hand outs on basic concepts that undergird details about the topic to be explored; use of vivid and concrete examples that reflect standards of excellent

performance related to the topic; and attention to assumptions and values related to why procedures are desirable as well as how to use them.

Adults learn best when they find out how well they are progressing Deserved praise and immediate recognition for achievement helps participants reinforce learning, recognize standards, focus efforts, and persist with their learning. Some concepts or skills are prerequisite to those that are more advanced. An important contribution of those who conduct continuing education activities is to select useful next steps so that learners progress. This entails attention to practice, variety, and pacing. Way to guide learning dynamics throughout an educational activity include: follow the flow of activities and decide on the questions or contributions that would contribute most to desirable progression; provide opportunities for participants to practice the proficiencies they seek to acquire; and vary the sequence of learning activities to sustain interest.

A staff development activity that reflects the foregoing generalizations would help teachers identify aspects of their teaching role for which they have questions to be answered, problems to be solved, and opportunities to be pursued. The staff development activity then includes exploration of relevant knowledge and experience elsewhere and practice applying questions and solutions to tasks important in their own teaching (Knox, 1980a). For example, Stritter and Hain (1977) describe a one-day workshop on teaching improvement. Workshop participants began by identifying the most effective and least effective characteristics of teaching that they had experienced. Frequently mentioned ineffective characteristics were inadequate feedback to learners and a concentration of theoretical instead of practical considerations. Many effective characteristics pertained to the teacher modeling desirable attitudes as well as performance. The workshop participants then thought of themselves in the learner role and rank ordered a list of teaching behaviors regarding the extent to which they facilitate learning, compared their rankings with actual student rankings, and then discussed similarities and difference between the two rankings.

Next came the only part of the workshop that was not discovery-oriented, but which was a presentation of principles of learning

and teaching followed by group discussion. The participants then individually evaluated a brief videotaped example of teaching, discussed their ratings, and then evaluated a second example. Evaluation criteria covered aspects such as setting objectives, selecting learning activities, providing practice opportunities for learners, and providing feedback to learners. These evaluation criteria were then used to assess teaching by participants in small role plays, after which the person who played the teacher critiqued his or her performance, followed by comments from others. At the conclusion of the workshop, participants made commitments about changes they intended to make in their own teaching.

Coordinating

The extent to which the foregoing generalizations about adult learning and teaching are applied to continuing education activities for school teachers and administrators, typically depends on those who coordinate such activities. For staff development activities provided by the school system, a number of teachers and administrators perform a coordination role by chairing curriculum revision projects, by being supervisors, and by directing workshops and institutes. Many of these same staff members also conduct continuing education activities for educators on behalf of the other two types of providers--universities and professional associations.

For generations school teachers and administrators have engaged in staff development and other continuing professional education activities. Included are institute days provided by the school system, credit courses provided by college of education, and workshops provided by professional associations. Because it has been so widespread and long standing, this professional development effort has been quite stable and routine. By contrast, many other professional fields have "discovered" continuing education in recent decades, which has resulted in both expansion and innovation. Each profession has distinctive characteristics and its members must develop continuing professional education to fit their own situation. However, there are also important commonalities across professions, such as program development procedures and ways to relate learning activities to professional practice, and compartive analysis can enable those who conduct professional development activities in various fields to learn much from each other (Houle, 1972, 1980). This is especially so for

those who perform the program administrator role by coordinating professional development activities (Knox and Associates, 1980).

The extensive and stable character of continuing professional education for educators reflects their familiarity with educational procedures, the relatively large number of personnel in most school systems and intermediate district, the variety of professional associations, and the large number of higher education institutions with teacher education programs. During the 1950's and 1960's expanding school enrollments affected all providers of continuing education for teachers and administrators. Declining enrollments during the 1970's are also having an impact.

By contrast, in other fields there have been rapid recent expansion of continuing education providers and enrollments, especially by professional association and universities. In many fields, a few university professional schools in each state are major providers of continuing professional education. The office that coordinates such activities tends to be somewhat independent of the resident instruction and research activities of the professional school. However, the centrality of this office varies greatly from field to field, from quite central for continuing medical education to quite marginal for continuing legal education. The continuing education efforts of schools of education are extensive, diffuse, and largely uncoordinated, with individual faculty members independently conducting courses and workshops. This is partly because most graduate students in schools of education are already practitioners which blurrs the distinction between preparatory and continuing education, which is quite clear in most other fields (Knox, 1980b).

In contrast with most other fields, continuing education for educators has settled into a routine. Of course there are changes, such as use of micro-teaching procedures with video tape replay, and the creation of teacher centers. But many professional development activities have become standard operating procedures that lack the sense of pioneering and excitement characteristic of corresponding activities in other fields in which such activities have expanded greatly during the past decade or two.

Several decades ago when school enrollments were burgeoning, continuing education efforts were stimulated by staff efforts to deal with expansion and change. Although the challenge to

professional development to help educators deal with declining numbers of students, teachers, buildings, and dollars is equally as great, the effect is depressing instead of stimulating.

Because of the widespread beliefs that staff development is everyone's responsibility and the nature of the problems and solutions are apparent, the procedures used to plan and coordinate continuing education activities for educators tend to be quite informal. Decisions about topics for professional development activities are selected by those who conduct the course or workshop on the basis of general familiarity with participants, in contrast with more formal needs assessment procedures in other fields (Pennington, 1980). Learning activities are predominantly reading, listening to presentations, group discussion, or curriculum revision projects, in contrast with greater use of technology such as video tape, audio tape, telephone networks, and computers in other fields (Chamberlain, 1980). Efforts to encourage participation depend on announcements, such as bulletins and brochures, in contrast with more extensive marketing efforts to attract hard to reach members of the profession in other fields (Darkenwald and Larson, 1980). Perhaps the assumption that continuing education is required for all teachers and administrators has discouraged use of more active procedures that are more widespread in other fields in which continuing education participation is assumed to be voluntary.

Attracting and retaining participants is only one major task of those who coordinate continuing professional education. Attracting, selecting, and orienting resource persons to conduct one or more sessions of an institute or a course is also important (Brown and Copeland, 1979). In addition to school teachers and administrators, professors and experts from education and related fields conduct continuing professional education activities. Some professors of education are quite active as resource persons for programs conducted by school systems and professional associations, as well as by colleges and universities. They are encouraged to do so because of their commitment to the improvement of practice as well as anticipate benefits for their resident instruction and research interests (Knox, 1980b).

Coordination of continuing professional education progrms varies greatly in the vitality of the effort. Vitality is reflected in

responsiveness, growth, innovation, and impact. The most vital instances are charcterized by one or more persons who provide educational leadership for professional development activities, by responsiveness to potential participants, and by attention to collaborative relationships (Knox, 1980b). Less vital coordinators perceive their role as making arrangements. Vital coordinators actively assess educational needs, focus program objectives, attract participants and resource persons, and evaluate the process and impact of the effort. Some attention is given to inprovement of such program development procedures (Knox and Associates, 1980).

Such procedures are designed to enhance proficiencies of practitioners, to improve performance, and to enrich careers. However, the most vital coordinators balance their attention to participants with attention to organizations (Schein, 1978). Included are all three of the major providers--school systems, professional associations, and higher education institutions. Large and innovative offices that conduct continuing professional activities tend to co-sponsor programs when this allows them to bring together participants and educational resources more effectively than through a unilateral effort.

The potential of mutually beneficial collaborative relationships is illustrated by cooperation between medical schools and community hospitals in the provision of continuing professional education. The hospitals benefit regarding staff development, improved patient care, and accreditation. The medical schools benefit regarding improvement of practice, strengthening of assistance to interns and residents, and encouraging referrals to the teaching hospital of patients with specialized health problems who are essential for resident instruction and research. Some school systems and schools of education have benefited from such collaborative relationships, but much could be learned from the experience of continuing education coordinators in other settings.

Learning Projects

Perhaps the most useful lesson that coordinators of professional development activities for educators could learn from their counterparts in other fields, is how to assist practitioners with self directed learning projects. Most educators engage in learning projects on their own each year (Tough, 1978). The challenge to coordinators is to provide materials and assistance to encourage

such projects to achieve professional development activities (Knox, 1974). Several ideas contribute to a rationale for doing so. One is to recognize the aspect of professionalization to which learning projects could contribute (Houle, 1980). Another is to recognize organizational as well as individual benefits of professional development (Schein, 1978). A third is to recognize major differences in teaching or administrative style and to help practitioners enhance their proficiencies within those styles (Knox, 1980a).

The same general points apply to the efforts of coordinators of continuing professional activities to enhance their own proficiencies (Knox, 1979). There are many concepts and practices from the broad field of adult and continuing professional education that could enrich their practice (Knox and Associates, 1980). This paper has highlighted some of them.

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This paper is the first of a number planned as a means of getting more articles/speeches/items of interest to our members. Your reaction to the idea, format, etc. would be appreciated.

THE CANADIAN COLLEGE OF TEACHERS

Occasional Papers

No. 2

YESTERDAY'S LEADER LOOKS AT TODAY'S EDUCATION FOR TOMORROW'S WORLD

Dr. A.B.B. Moore, former Chancellor of Toronto University and Moderator of the United Church of Canada. Keynote speaker at the 1982 AGM Conference of the CCT.

(With reaction panel notes courtesy of Roy Schatz, FCCT, Central Ontario Chapter.)

The topic assigned me this morning is a somewhat pretentious one. First of all there is the term "yesterday's leader". It is true I have been retired for twelve years and therefore definitely belong to yesterday but I would not dare lay claim to be a leader in that day. As for "today's education" who would dare to assess its strengths and weaknesses from the gently rocking chair of retirement? Even more intimidating for me is to accept the role of prophet for who in the midst of this confusing, uncertain and hurting world would venture to predict what should be in store for us tomorrow?

These were some of the questions that arose in my mind. Far more substantive questions were in the offing when my topic was placed against the background of the theme of this Conference -"Teaching for Total Living". What definition can one give for total living, how can one relate to the structures of teaching and what realistic

possibilities are there in either today or tomorrow? With such questions lurking in the shadows of my mind the task of dealing with my topic became a forbidding one.

I decided that the only way I could approach it was to forego any discussion of terms such as leader or prophet and to concentrate on what was for me the operative word -"look". This was a bite out of the subject that I could possibly chew. Surely I could look at the contemporary situation through the eyes of my experience and from the perspective of my convictions. John Heywood's ancient proverb says that even a cat may look at a king. Even a senior citizen may look at his present world and dream of a world he will not see. So that is my excuse for joining what Jacques Bargun calls"this unquenchable talk on education". I have no claim to expertise but only that I have been involved in education for half a century and still survive.

Any look at today's education reveals that the whole process and those involved in it are under heavy pressure. There is the pressure of declining school and university population and what that means in teaching positions becoming redundant. There is the pressure of inadequate funding at most levels which can and does have impact on the quality of education. But the heaviest pressure of all is the constant barrage of criticism directed against the current educational system. Anyone who wants to hit the headlines can do it by condemming present day education. There are those who see its failures in terms of the inability of its products to communicate in clear understandable English. However when I hear that criticism my mind goes back more than thirty years to my first year at the University of Toronto when I became president of Victoria. That year the President of the University, Dr. Sidney Smith spoke of the inability of high school students to express themselves and referred to it as a condition of crisis proportions. The university, he said, must provide courses in remedial English. Our present day critics come from that generation and have evidently forgotten the crisis of their own youth.

There are those who criticise the system as failing to prepare students for work in the real world. There should be more technology, there should be more job related training, the whole system should go back to basics although this latter term seems little understood by those who use it. The educational process

fails to develop social values and character strength. Prescribed books are condemmed and censored and even burnt. Whatever is wrong in our society the response is predictable - blame education, blame the schools and universities, blame the teachers and professors. No week passes that there is not some report condemming or criticizing today's education. In mid-June there was a front page report from a McGill professor predicting the collapse of the whole system by 1990. While most criticisms do not reach such apocalyptic proportions they continue to exert pressure and mostly of a negative kind. The school system and its teachers are the victims of the scape-goat syndrome.

So the pressures of economic problems, the statistics of declining enrolment, the confusion of goals in the whole process of education, problems of contemporary society ranging from violence and alienation to cynicism and despair, all of these and more are laying a heavy burden on today's education. When yesterday looks at today that is what is seen. It is not new, of course, but it is none the less critical and urgent.

I have neither the time nor the ability to attempt to analyse these problems and to provide pat solutions. Let me comment only in passing that the many solutions which appear in the press from time to time seem overly simplistic. They indiçate that we have not yet caught up with the dilemma imposed upon us by mass education. If there is to a free, responsible society its citizenship must be an informed citizenship with knowledge of self and society, of the world and its life. If that society is to achieve its own goals its citizens must have insightful judgement and recognized values. Without that sort of citizen, government is by the elite which at its best moves toward paternalism and at its worst toward tyranny. To cope, therefore, with the problems that bedevil today's education we must come to terms with the human factor and we must not let voices attract us to other courses. In our society we are committed to universal education.

My look at today's education began with a mention of the pressures upon it not because I wished to set up straw men and knock them over with a few well directed words. It is rather to have my view of education set against the background of all that threatens it. I am not dismissing the criticisms as if they did not matter for I recognize that many of them are based on very good grounds. In

other words what does it mean to teach for total living where numbers blanket us and money eludes us, where society breeds violence and denigrates the individual, where technology sometimes dehumanizes and the labour market says "I don't need you".

'Total Living' is a difficult term to define. It has elements of quantity about it - quantity in terms of the ability to do many things; the cultivating of many interests, and the discipline to utilize fully the time at one's disposal. Education is also concerned with values. No one person can do everything. What things should be chosen? What interests should be cultivated at the expense of other interests? What do we do with this day that lies at hand? It becomes apparent at once that education for total living has to do with more than quantity. Without the education of the person at the centre life becomes an unorganized heap of unrelated activities and interests, a jumble of lived through hours. There must be a self that says I will do this and not that, I will love that and not this. From these choices flows a significant and correlated whole.

This brings us to the obvious conclusion that education for total living is concerned with the persons involved, who they are and what sort of beings they are. Programmes, aids, physical conditions are all important but are only justified in what happens to the people in the midst of that process. Any approach to an assessment of today's education must be based on that understanding of what it means to be fully human and how that informs and directs the whole system.

Who is this human being for whom education exists? He or she can be described in a multitude of ways -a being of mind and emotion, a being of interlocking social relationships, a being of physical structure and psychical history, a being who has emerged out of the matrix of this physical world and universe, a historical being complexly formed by all that has gone before. Total living is involved in all these descriptions.

The person is a creative being. This creative being is the growing point of life, the source of new ideas, new thoughts, new knowledge, new relationships. The educational process is not concerned primarily to fit persons into the molds of a pre-constructed world of knowledge and society.

Creativity must be based on knowing and understanding; who we are, how we came to be, how we live with one another and how our universe moves. That in itself is a big agenda for education. But it must not stop there for this could result in the person becoming a standardized unit in society's asssembly line. This gives conformity priority over creativity -and makes docility rather than daring the quality to be coveted.

Too often creativity has been understood as the mark of genius. Actually it is the human condition of every person. This is not to claim that everyone is equally creative any more than to claim that all are equal in ability and intelligence. Nevertheless 'teaching for total living' must recognize every person can be creative within the limits of his powers. The educational process in all its complexity is based on the premise that to be fully human is to be creative. This is the heart of the teacher-student relationship.

I am aware of the overwhelming difficulties of such a relationship in a mass education system. The classroom conditions in a society where often violence is a way of life, where disadvantaged students are ever present, where individual relationships are minimal make conditions for the arousal and nourishment of creative persons well nigh impossible.

Neither the system nor those involved in it can abdicate the responsibility of dealing with persons who can be, indeed must be, creative. Here are beings who have the capacity of imagination, who have the ability to make the leap from the old to the new, from the known to the unknown. Within the process they have learned to be instructed by the past but not imprisoned by it. The creative persons must have the capacity to express their experiences in communicable language and in loving relationships. Our educational process should be informed and shaped at every level by the recognition that its participants are human and therefore creative. It is oversimplifying the matter to say that the heart of this process of creativity is the teacher-student relationship. There are new and sophisticated aids to learning. These are to be welcomed and to be used as effectively as possible. Computers and word processors are becoming the familiar furniture of education. There is an aura of mystery and wonder about these to one who hasn't got beyond the use of his fingers and pen. Computers cannot

replace the person to person relationships in education. As one writer points out in a recent copy of the Smithsonian magazine, most creative persons in society have been touched at some point by a teacher who says "You matter". The sense of self and self-worth which is the ground of creativity is developed in those personal relationships.

In most areas of education today individual teaching is unattainable. Many teachers do make personal contact through the system - sometimes in spite of it. One of the most influential teachers I had was in a class of more than a hundred students. His presentation reached me as one individual in that class. He created excitement and hunger in me. He awakened me to a new world and helped me to create that new world. I was one of many but that relationship made me a more creative person. In the educational process we are not necessarily the prisoners of the system.

The confused world of education today faces immense problems, and carries heavy burdens under great pressure. The teacher's place is central because the educational process deals with the creativity of students. Knowledge is vital and creative when it results from the confrontation of person with person. Information can become encyclopaedic in scope but it becomes living knowledge in the creativeness community of student and teacher. Technology is with us to stay whether we like it or not. It may seem threatening but it need not be if it is directed by a humane person in all his creativness. Today's education may have its technological dimensions but it is alive because the goal of creativity in total living is still in sight as it focusses on the creative student and the creative teacher. That seems to be where we are at in today's education. There are obvious weaknesses but it is alive. Perhaps that is small comfort to the teacher who has been sidelined because his position has been declared redundant. It is small comfort to students who are feeling dehumanized by a technological world. It is also small comfort to schools and college administrators who are being hamstrung by fiscal restraint.

Tomorrow's world lies beyond the horizon of our certain knowledge. There are some signs that point toward the wonder and terrors with which people will have to live and survive. Some years ago Alvin Toffler tried to warn us of what might be. He seemed to come out about even in his predictions concerning doom or survival. Futurists try to trace the shape of things to be and are

alternately depressed and inspired by what they see. How does this affect education today -what can it do to prepare for tomorrow's uncertain and unknown world? There are of course, specific tasks in the area of expanding, indeed exploding knowledge that will have a direct relationship on what happens. The world of tomorrow will still be a world of persons living in society. The shape of that world is emerging in the people involved in today's eduation. The best contribution today's education can make to tomorrow's world is the nourishment of creative persons whose habit of mind will move them to new understandings of the human being. Education today for total living tomorrow seeks to serve the human being to become creative in nature and purpose. I believe in a system which seeks to include the entire citizenship regardless of race, creed or class. I realize that must be done by a combination of agencies public and private. I affirm this system not as a way of standardizing all and subjecting them to one understanding of life. I affirm this system as giving to everyone his experience of total living as creative persons. I believe that in areas of the process this is taking place, because of the teachers involved. These are areas of hope for today and tomorrow. I am a man of hope when I asess their possibilities of education. Today there is much gloom and doom -look at what is good in our world of education and have hope.

REACTION PANEL
Fr. Charles Holland, Dr. Earle E. Newton, Dr. Bernard Shapiro

Dr. Shapiro
The conference is ambitious. It is a vision in which we can participate but for which we are not entirely responsible.

Individualism can degenerate into anarchy The collapse of the core curriculum has had detrimental results. We must choose among values: the social fabric will not support an infinite range of values. It is up to educators to help define the limits of that range. People are asking for that help.

If pupils are not to be standard units on the assembly line, then teachers must also have some creativity. They must be to a certain extent free to fail. Unfortunately the threats to the school system which Dr. Moore mentioned are tending to make teachers defensive, retreating behind their subject walls or other defense mechanisms.

The future holds one promise: more change and less guidance. Education is a kind of myth the empirical evidence for it is not evident.

Rev. Charles Holland

"Gloom and doom" (as opposed to "have hope") "What do you think your future is going to be?" was asked to junior high school students. Their answer was totally negative: there wasn't going to be a future for them. If there is nothing there, why are we making something there? The future belongs neither to the fully human nor to the creative person. Plato put the young people up against the wall. He asked them what it was to be human. That is where Fr. Holland sees the future for the young. If the world out there is to be a bleak one then they must find out who they are and why they are, for the world inside them will be the most important one. We must get back to the old Greek world, the world in which the world of man is to find himself.

Dr. Earle E. Newton

In Saskatchewan the school world is more and more political. The people are consulted and there is not time to consider Plato's thoughts. In a recent effort to revise the social studies curriculum the people said that the social studies curriculum should focus on the present drawing in the past to gain understanding of the present, the future should have the least emphasis. Attitudes are as important as information. (Saskatchewan has a major problem with prejudice against native students). Parents want their children to graduate with a current world knowledge.

Citizens want current issued to be discussed but teachers insist on up-to-date materials and a supportive environment (not phone calls from trustees telling them to cool it). A basic question is whether there can be an open curriculum in a closed community.

There is an unwise presentation of the alternative of today's schools being yesterday's schools. We need to think of alternatives. Can we be equal and excellent too?

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THE CANADIAN COLLEGE OF TEACHERS
Occasional Papers
No. 3

EDUCATION FOR EVERY DAY LIVING

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(Dr. Young, a Professor at the University of Saskatchewan, has been a member of the College since 1967 and a Fellow since 1975)

Each morning, in our culture, we rise and decisions begin. A glance out the window, with an ear to the radio, to discover the temperature, and a thought to the occasion to select the clothing to be worn this day. What foods and beverages should we select to have a nutritious start to the day? What needs to be done to leave the home in order? What purchases must be made to supplement the dinner ready in the freezer? Are mortgage payments due this week? At home that evening, what have different family members accomplished that day? Who needs reassurance? Who needs to be listened to as the tensions of work or school are released? What cleaning and mending must be done to maintain the environment and conserve expensive items? Are the lunches ready for tomorrow? Has someone brought the cat in? Is all in readiness for tomorrow, so

Abstract
This paper is a descriptive study of home economics which through emphasis on the family and the processes of consumption; management of resources; control of the environment; concentration upon the daily needs for food, shelter, clothing, and relationships provides education for every day living. The questions: What is home economics? What influences home economics? What is the current situation at university level, in the professional organization, and in the elementary and secondary system? were addressed. The home economics curricula for the provinces were examined.

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we can go to bed to refresh ourselves for another day? Is there a leisure activity at which we might relax? These are some of the decisions and processes that are a part of Canadian every day living. They are also components of home economics education.

The purpose of this paper is to review the past history of home economics education and to describe the current emphases in home economics education, in order to prepare for future education in every day living.

What is Home Economics?

Throughout the twentieth century many persons have devined home economics. "Home economics is a study of the laws, conditions, principles and ideals concerned with man's immediate physical environment and his value as a social being, and especially the relation between the two." (American Home Economics Association, 1902). "Home economics is the study of household management for achieving the highest quality of life." (Kyrk, 1933). "Home economics is the search for new information about family needs.....a field of service in which families shape both the parts and the whole of their pattern of daily living." (American Home Economics Association, 1959). "Home economics is the science of relating families to progress." (St. Marie, 1973). Home economics has the purpose to integrate the sciences, both natural and social/behavioral, with the humanities/arts to improve daily home life.

What Is the Focus of Home Economics?

An analysis, of the above statements about home economics and others in the literature, places the focus on people in families. The relationships exhibited are between people, and between people and their environment. This interaction between people and environment is found in Lewin's field theory (1951) and his notions about life space. This ecological theory is the base of Bronfenbrenner's (1977, 1979) human development theories. The levels of development derived by Bronfennbrenner were identified as the microsystem, or activities of the individual, the mesosystem or interrelationships at the interface with other individuals and systems, the exosystem or events which involve significant others, and the macrosystem, which focuses on beliefs, lifestyles, and values. These levels are related to every day living and the decisions made each day.

What Influences Home Economics?

The above review indicates the influences on home economics in Canada. The references were primarily American. The basic disciplines were the natural sciences, which are essential to understand the environment and the human body and the social/behavioral sciences, which are related to people and their society. Values are a component of philosophy. Aesthetics are needed to order the environment. These disciplines have a place in everyday living and in home economics, a place that might be stressed in future (Young, 1981, Arcus, 1981).

Home economics has been influenced by societal issues and events. At the beginning of the twentieth century when many immigrants came from Europe, foods classes were introduced into the schools to assist these new families adjust to available Canadian foods. During World Wars 1 and 2 when food was limited, recipes that conserved on imported foods, that used local substitutes such as rose hips to provide vitamin C were developed. Following World War 2 when many wives left home to work, home economics developed and taught management strategies to utilize time and energy. In the late seventies as the energy crisis evolved, home economics classes were concerned with cooking methods to conserve energy, clothing styles to maintain body warmth as temperatures were lowered and home construction and repair to save energy. Now as mortgage rates and inflation spiral, money management and consumer practices have come to the fore.

Trends that were of particular concern as the decade of the seventies concluded were the acceleration of change, the importance of the individual, the quantity and quality of education that is external to the school system, the continuous process of education throughout life, and the mobility of families as jobs are changed (Nova Scotia Department of Education, 1978).

What is The Current State of Home Economics?

University level. At the university level, ideas were expressed about home economics at the Learned Society meetings in 1981. Badir (1981) described home economics as the study of man in interaction with the environment, which included housing, home furnishings, household equipment, clothing and textiles, food, and family. Shivers (1981) indicated that home economics contend addressed quality of life and focused on the well being of the individual and the family, using laboratory methodology to apply

theory. Vaines (1981) placed the focus on the helping relationship the home economist established with people. Welsh (1981) pointed out the use of ecological principles in colleges of home economics in order to consider the consequences of pollution and responsible consumption to permit people to meet their basic needs with self reliance. Young (1981) related home economics to the ecological models of Lewin and Bronfenbrenner discussed above. Clark (1981) and Engberg (1981) deemed management concepts essential to home economics stressing time use and management of resources respectively. Engberg and Heslog (1981) found that most people do not want to live a conserver lifestyle. Home economists will require education in changing the attitudes of family members.

Professional associations. The Canadian Home Economics Association is concerned at this time with appropriate technology. Prior (1981) was commissioned to prepare a position paper on appropriate technology and has suggested that schools make available suitable workplaces to design and apply technology related to food, clothing, and shelter. This application of science should be concerned with socio-economic values as well as technical efficiency. Cebotarev (1981) recommended increasing productivity through the use of local materials in order to increase income and strengthen the family. Peterat (1981) established three systems in applying appropriate technology to a study of curriculum: the technical system, which was concerned with rules and standards; the interpretive system, which was based upon affect and valuing; and the emancipatory system, which arose from political action. Moss and Dunn (1980) described an appropriate technology curriculum as one which reflected the needs and problems of society, and was grounded in the culture, permitting applied research to test ideas.

Elementary and secondary school systems. What needs and problems of society are reflected in home economics curricula at the present time in Canada? Curricula from the provinces were examined on microfiche to determine the focus of home economics in each area.

Ontario has two curricular areas entitled consumer studies and family studies. The focus in consumer studies, written in 1972, is to help students become knowledgable purhasers. The purposes identified were:

- -to assist the student clarify an analyze consumer values.
- -to help the student gather and interperet information about goods an services.

-to have students develop decision making patterns.

The intermediate and senior family studies programs established in Ontario in 1973 and 1977 included five areas of study. There was a focus on:

family: function, relationships, development of members and their values.
foods: significance, nature, and provision.
clothing: significance, nature of textiles, acquisition, use and creativity in construction.
management: values, philosophy, resources.

The purposes in family studies courses stress appreciation, decision making, problem solving, and skills.

Alberta and North West Territories curricula in home economics were revised in 1972. The purpose was to enable youth to meet and solve the problems of every day living. The focus was on experiences which would improve and strengthen the quality of life and standard of living of individual and family living. This was to be done by providing activities which would develop attitudes, skills, understandings, and tchniques essential to the maintenance and improvement of the home, which might also be of value as a vocational persuit. Concepts related to health, appearance, personality, the use of money, and understanding and relating to others were included. In 1975 a teaching resources handbook was published for the three areas of the home economics curricula: clothing and textiles food science, and modern living. In 1976 an additional curriculum in consumer education was added to develop awareness of the forces in the marketplace. This included a study of the economic system, decision making and valuing; consumer motivation, buymanship and money management, and consumer rights and responsibilities. North West Territories utilize the Alberta curricula for home economics.

Quebec revised the home economics curricula in 1974. A teacher's guide was prepared in 1975. A handbook to all curricula was issued in 1978. It was pointed out that progress in science and technology has outdated the families need to produce. Currently the more important process of families is consumption, but families need to maintain a balance between their needs and the resources available.

This decision making was the focus of the courses in Quebec. Themes in home economics included:

family living: shelter, security, communication, and consumer decisions

food an nutrition: practical culinary arts, appreciation of foods variety, quality, and nutrition for well being

clothing and textiles: personal preferences and needs, fabric, consumer goods, construction.

Housing and design: business matters, environmental quality, lifestyle.

Nova Scotia had home economics curricula revision in 1978. The focus was on the family and the family in the near environment. Consequently food, shelter, health needs, education, work and leisure time activities were of concern. The goal was to achieve favorable development of students through their day to day experiences. The unique concern of home economics was for the well family. Interest in the family was furthered with the introduction of the Exploring Childhood curriculum in 1978 with the purpose of providing eduction for parenthood. A concern for individuals with special problems was expressed in the 1977 publication Home Economics for Children and Youth With Exceptional Learning and Behavior Characteristics.

New Brunswick Home Economics Education (1978) included eight major goals. These goals and the titles of the courses focus on human development. The eight goals were written around the concepts: self concept, values, goal development; relationships, responsible thinking, development process, to promote health through the use of food, clothing, and shelter, responsible attitudes toward social issues such as population planning, energy conservation, pollution control, and resource management.

British Columbia and Yukon work from a revision of home economics curricula in 1979. The purpose was to educate young people to function effectively as individuals and as family members throughout their life span. An increased emphasis was placed on the family, nutrition, consumer skills, conservation, and leisure. Eight goals were stated which included the emphases listed above and a statement regarding dealing effectively with change, creating and appreciating beauty in the environment, all linked with the Ministry of Education Core Curriculum. Yukon uses the British

Columbia home economics curricula.

Prince Edward Island implemented the Basic Home Economics for Junior High in 1978. This course was directed toward living rather than making a living. Family studies, foods, and clothing were the themes. In 1979 a curriculum for family living in the senior high school was initiated with the purpose of educating youth to meet an solve problems of every day living in order to improve future families. Emphasis on the home environment was added with a curriculum in housing for senior high in 1980.

Saskatchewan curricula were phased in between 1966 and 1970. The junior high curricula stressed practical skills related to food and nutrition, clothing and textiles, self development, and family membership. These practical ideas were linked to more advanced and theoretical senior high half classes in foods, clothing, finance, family life, and housing through a grade ten class in Management for Living. In 1973 consumer education was stressed with the development of the Consumer Resource Center by the Department of Consumer Affairs. These courses have been revised during the 1972 to 1980 period. Currently all curricula in Saskatchewan are being studied. New home economics curricula will be developed. It appears that the stress will be on living skills (Ashley, 1981).

Manitoba did not have home economics curricula in the microfiche studied for this paper. It is assumed that the courses were written before 1970.

Newfoundland did not have microfiche available. The home economics supervisor position in the Department of Education is open.

Conclusion

This has been a brief descriptive study of the history of home economics, the influences upon this area of study in Canada, and current emphases at university, professional organization, and elementary and secondary levels of th school system. Throughout the focus has been on the individual in the family system. This system and the home environment are vital for the normal development of an individual. To survive and to achive a lifestyle with a desirable quality, the every day needs of food, shelter, clothing, and relationships must be met. Home economics is an essential part of education for every day living.

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THE CANADIAN COLLEGE OF TEACHERS
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No.4

THE RELATIONSHIP BETWEEN COGNITIVE STRATEGY TRAINING AND PERFORMANCES ON TASKS OF READING COMPREHENSION WITHIN A LEARNING DISABLED GROUP OF CHILDREN

By Anne Brailsford, Reading Specialist, Edmonton Public School Board

The relationship between cognitive strategy training, as conceptualized within the framework of the simultaneous-successive model of information processing (Das, Kirby, & Jarman, 1979), and reading comprehension was explored in the present study. The purpose of this study was to determine the efficacy of a remedial strategy training program in improving performance on simultaneous and successive information processing tasks, and also on tasks of reading comprehension.

A group of twenty-four, nine to twelve year old learning disabled children, enrolled in reading resource room programs at two schools, was selected for this study. The children scored above IQ 85 on the non-verbal section of the Canadian Cognitive Abilities Test (1974), and below the 35th percentile on the comprehension sub-test of the Gates-MacGinitie Reading Test, Level D (1978). Students were assigned to either Experimental or Control Groups, so that each group was composed of twelve children, six from each of the two participating schools. Both groups contained eight boys and four girls. No significant pre-test differences between the groups were obtained for age, IQ (Canadian Cognitive Abilities Test), and reading comprehension (Gates-MacGinitie).

A pre-test battery, consisting of simultaneous and successive tests, tests of reading comprehension and tasks to measure the speed of processing, was administered to each member of both groups. Reading comprehension was assessed quantitively, in terms of reading grade equivalent scores (Gates-MacGinitie) and reading instructional levels (Standard Reading Inventory), and also qualitatively by analyzing the nature of information contained in the children's story recalls (Protocal Analysis, Fagan, 1980). The Experimental Group received fifteen hours of remediation in the task-appropriate utilization of simultaneous and successive information processing strategies. The Control Group received fifteen hours of remedial reading instruction within the resource room programs at the two schools. Both the Experimental and Control remediation programs were conducted with small groups of children. At the conclusion of the intervention phase, a post-test batter, replicating the composition of the pre-test battery, was administered to examine the effectiveness of remediation.

Significantly better Experimental, than Control Group, performance on all the successive tests and one test of simultaneous processing was attributed to the cognitive strategy training program. The Experimental Group obtained significantly higher instructional reading levels (Standard Reading Inventory) than the Control Group, at post test, and this improvement was viewed as a demonstration of the effectiveness of intervention. In a qualitative analysis of the children's recalls of stories, no significant group differences were observed. However a descriptive overview of the results illustrated an Experimental Group trend towards the increased production (Pre/Post) of inferences, summaries and syntheses, and a Control Group trend towards the increased production of erroneous information and vague generalizations. It is apparent that, in order to offer further clarity on the nature of readers' recalls of stories, larger numbers within the groups are necessary.

The findings of this study suggest the viability of isolating educationally significant sub-groups from within a learning disabled population, and analyzing task failure in terms of the processing demands placed on the child. This study has isolated a group of 'poor readers' and examined the task of reading comprehension in terms of the information processing demands placed on the reader. The results support the efficacy of structuring a cognitive strategy training program, embedded in the simultaneous-successive model, for improving the reading comprehension

performance of learning disabled children experiencing reading failure.

A great deal of educational research time has been invested in defining learning disabilities for the purpose of funding, placement and educational programing for such children. Definitions, such as that included in the United States' Education for All Handicapped Children Act (P.L. 94-142, 1975), may broadly assist administrative funding decisions but offer little productive information for the teacher. Recent research, in attempting to isolate homogeneous sub-groups of learning disabled children from a largely heterogeneous population (Fletcher & Satz, 1979, Rutter, 1978) may offer more salient information for teachers in the future. Presently, teachers may, for example, be programing for children experiencing severe reading difficulties in an eclectic manner or utilizing approaches embedded in specific 'deficit' or 'lag' rationales e.g., perceptual-motor training or linguistic remediation.

This study focuses on children with reading difficulties who are functioning intellectually within the average range. Such children, within our school systems, are most often placed in special learning disability classrooms or remain within the regular stream and receive remedial reading assistance. Lerner (1975) has observed that whatever the philosophical basis of programing, the major portion of teacher time for children defined as "learning disabled" is focused on remediating reading problems.

The present project offers an alternate view to educating the reading disabled child. It does not dwell on supposed within-child deficits nor become entangled with definitions. It does offer practical teaching suggestions and programing, embedded within a theoretical framework.

1. The study, as an alternate to examining 'developmental delays' or 'deficits,' looks at reading itself, in terms of the information processing demands the task places on the child. Within the theoretical framework of simultaneous-successive synthesis (Das, Kirby, & Jarman, 1979) an attempt has been made to focus on the specific processes required for tasks of reading comprehension. The study suggests that, to varying extents, both simultaneous and successive processes are interactively required for reading

proficiency, with an emphasis on simultaneous integration for high level, conceptual, comprehension tasks (McLeod, 1978). Hence, with this approach, the teacher is encouraged to examine within-task processes rather than child-centred deficits. Each area of academic difficulty can be viewed, by the teacher, in terms of processing demands placed on the student.

2. Torgeson (1977) has suggested that learning disabled children may be characterized, not merely by ability deficits, but by performance difficulties, i.e., by "their failure to apply efficiently those abilities or capacities which are present" (p. 34). Hence, practical remediation dwelling on teaching isolated production skills may have limited utility if those skills are not actively and spontaneously applied by the learner. This study focuses on teaching cognitive strategies i.e., the 'how and when' of utilizing task-appropriate processes.

Thus, inclusion of a strategy training program may prove to be an invaluable component within the learning disability classroom or resource room. Such a program teaches strategic behaviour so that children are encouraged to "employ the optimal processes in a task" (Das et al., 1979). The remediation does not focus on training simultaneous and successive processes alone by on task-appropriate use of those processes. An important aspect involves eliciting the child's conscious use of the strategies by discussing the procedures, summarizing the task, and predicting future task approaches. Stimulating cognitive awareness of appropriate strategies may be considered a keystone of remediation. The remediation program was designed to stimulate "more intelligent" behaviour (Sternberg, Ketron, & Powell, 1980) in terms of training cognitive strategies that could be generalized to tasks of reading comprehension.

3. The cognitive strategy training program is not only a theoretical concept, but has been demonstrated as a practical reality within this study. The tasks were designed, materials constructed, and then teaching proceeded at two schools with small-group instruction. As the main findings of the study indicated greater Experimental (strategy training) than Control (remedial reading) improvement on four tests of cognitive synthesis and on instructional reading levels, it is suggested that the group receiving strategy training was able to transfer strategic behavior to a task of reading comprehension. To implement this program in

schools basic teaching requirements include:

a) Comprehension of the theoretical framework and the ability to view the remedial tasks in terms of the information processing demands placed on the learner.

b) Adaptation of materials and structuring tasks to encourage the optimal use of task-appropriate strategies. Subsequent to instruction concerning the theoretical constructs of strategy training, teachers may quite easily adapt commercial materials and common household articles for remedial purposes.

c) Encouragement of the active participation of the student through verbal interaction during the tasks. This permits the teacher to monitor the processes being utilized, provides a problem-solving strategy for the child, and may facilitate generalization of strategic behaviours.

In conclusion, Spache (1976) levels a criticism against our present school-based remediation programs for children experiencing severe reading difficulties:

> The manner in which remedial services for learning disabilities are established is often a rather unscientific and unplanned procedure (p. 350).

It is suggested that the intervention procedures encompassed in the cognitive strategy training program offer a structured, planned approach to learning, developed within an information processing framework, and as such may provide a practical addition to resource room or learning disability class programing.

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APPENDIX 1

Task 1: Tracking [An adaption of a pre-school diagnostic test (Venger and Kholmovskaya, (1978)]

A large sheet of card 55cm. x 70 cm.) was pinned on the wall just above desk height from the floor. On the card was a line drawing of a map of a 'village of thirty-two numbered houses, twenty-four lettered fir trees, toadstool landmarks, five main roads and several side streets. Twenty-two tracking cards (18 cm. x 12 cm.) were placed on a desk in front of the wall map. Eleven of the tracking cards illustrated a line drawing from a starting point to a specific, numbered house, and eleven illustrated a journey from the same starting position to a lettered fir tree. The tracking card map outlined the roads and street intersections, and the child's task was to survey the card and the village map and locate the number of the house or the letter of the tree. Task 1a asked the child to complete the house-tracking cards and Task 1b to complete the thee-tracking cards. Three timed trials were allowed for each task.

Step 1: The card of the village map was hung on the wall at the child's eye-level. A desk was placed in front of the map, and the eleven Task 1a cards were positioned on the desk. The teacher explained to the child that:

a) Each tracking card was a journey from a "tuft of grass," at the start, to a house.
b) He was to imagine that he was the village mailman and had to deliver a letter to the house shown on the tracking card.
c) The map had to be surveyed and the tracking card used to find the correct house. Careful attention had to be paid to the directions of the streets and the landmarks on the tracking card and the map.
d) The house number had to written on the answer sheet, e.g., Card 1=House 3.
e) The task would be timed, i.e., completion of all eleven cards, and he should find the houses as rapidly as possible.

The child would ask to explain the task, to check that he had understood the directions. If the child was unable to verbalize the directions a spare, trial journey card was produced and the

teacher re-explained the task instructions, and asked the child to repeat them in his own words.

Step 2: The child completed the eleven tracking cards in Task 1a, by locating each house and marking the house number on a prepared piece of paper. The task was timed.

Step 3: The child's location of the houses was checked, and he was asked to verbalize his procedure on several cards, e.g., "I knew the road had to go straight up to the fir tree, and then I went to the right. I passed the second intersection, travelled to the first house and delivered the letter to house thirty-two." If the child made errors the teacher asked him to re-do the journey, verbalizing the route, until he reached the correct house.

Step 4: The child repeated the timed task twice more. Between each timed trial the child was asked to summarize the task, and discussion focused on the strategies and clues used to complete the journeys more rapidly, e.g., shape of the roads, distances and

Step 5: During the next teaching session the child reviewed the task and was asked to complete the eleven cards on Task 1b, where the child was asked to complete a tracking journey to a fir tree, in order to meet a friend. The child was given three timed trials on Task 1b, with the object of completing the task more speedily on each trial. Strategies of visual searching, and using visual clues and landmarks, were reviewed between each timed trial.

Step 6: Summary of Tasks 1a and 1b: Discussion and directed questions focused on verbalization of the stages in the task, and reviewed the importance of organized visual scanning, and using all available clues, such as landmarks, distances between intersections, and comparative shapes of the roads on the map and the tracking card.

Task Focus: Primarily the task was designed to focus on simultaneous processing. Simultaneous synthesis or the, "integration of the individual stimuli arriving in the brain into, simultaneous, and primarily spatial groups" (Luria, 1966 p.14), would be the most effective processing strategy to survey both the map of the village and the line drawing on the tracking card. Successful completion of the journey involved preserving the spatial relationship amongst roads, streets, houses, trees and

toadstools, and comparing the spatial organization with the tracking map. Verbalization of the journal involved both simultaneous and successive coding. Simultaneous processing would be used for surveying the tracking card and map as the journey was described, and successive processing for sequence the narrative chain of events from start to completion, e.g., "First I travelled straight up, and then I turned left at the second toadstool."

The children's verbalizations aided in the investigation of the strategies used for the task. Two children had very slow times on the first timed trial of Task 1a. Though neither child produced spontaneous verbalization, when asked to explain how they completed the task they made the following responses,

Steven: "First I pointed a bit of the way on my card, then I checked on the map, then I pointed a bit further...to the next turn-off."

Ronnie: "I look at the intersections one at a time. I count, this one, then this one, then this,"

demonstrating that they were using primarily a successive strategy to complete the task. At the completion of trial three, when each of their timed trials was less than half of the speed of the first attempt, they explained,

Steven: "I looked for the shape. By the end I could tell at a glance. I learned to ignore half the map. I just looked at one side or another. If I wanted to be fast I just looked at the road directions in a glance."

Ronnie: "Now I look at the distance and judge it...and if the roads twist, and whether it's left or right of the main road,"

appearing to demonstrate a change to the more successful, task appropriate, simultaneous processing strategy.

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ATTENTION AND DISABLED READERS: A TOP-DOWN PERSPECIVE

By Judy Lee Lupart, Department of Education Psychology, Faculty of Education, University of Alberta.

Various theoretical and experimental approaches have been used to determine why the major proportion of those identified as learning disabled are unable to learn to read or read at the level of their IQ and chronological age matched peers. One often given explanation of the learning difficulties of this group is the notion of attention deficit. Traditional "filter" and "capacity" theories of attention have been adopted to test this notion and the experimental results emanating from the typical "matching familiar figures" or "incidental learning" paradigms have been acknowledged as supportive of an attention deficit hypothesis in the learning disabled. However, there appears to be a growing dissatisfaction with this traditional viewpoint, and the notion is currently being attack on several fronts (Douglas and Peters, 1979; Pelham, 1979).

As a result of the many shortcomings of traditional attention models, theorists and researchers are beginning to advocate an alternative model of attention which features both perceptual and cognitive aspects of attention. Although there is no general "cognitive" or "intractive" theory of attention at present, there are certain characteristics which set this approach apart from traditional attention theories. The most important characteristics are that; cognition guides attention (Neisser, 1967); that attention organizes perceptual intake (Hochberg, 1978); that attention is intrinsically tied to the planning (Hochberg, 1976),

purposive (Gibson and Rader, 1979), executive (Mackworth, 1977) or metacognitive (Douglas and Peters, 1979) abilities; that attention undergoes qualitative changes across development (Gibson and Rader, 1979) and that optimal attention is achieved through self-regulation (Douglas and Peters, 1979; Mackworth, 1977).

In an attempt to integrate these research avenues, a "cognitive" view of attention in reading was outlined as comprising both "bottom-up" and "top-down" processes. The former is associated with various reading subskills such as attention in letter discrimination, or word identification, whereas the latter processing refers to the reader's attentional planning and self-regulatory abilities that are utilized in their day-to-day, functional or recreational reading. It is then argued that, by assuming this bi-directional view of attentional processing in reading, the proficient reader is one who can flexibly apply his/her attention to the visual information on the page; to the interpretation of the author's meaning; to his/her own reflective background knowledge, or to an overriding macro-goal that can be self-regulated or other imposed. Where the attention gets allocated is self and situationally determined. The decision for attentional allocation is dictated by the reader's self-defined or interpretive view of the task purpose. It also seems likely that different attentional allocation strategies are more efficient for different tasks, and that the proficient reader would selectively rely on those most expedient to his/her goal. Following a review of the reading literature it was concluded that:

1. Researchers in the area of reading literature have begun to explore attention as a "top-down" process and there appears to be considerable agreement to the notion that optimal attention involves intention planning, and self-regulation. This position is very similar to the "interactive" or cognitive" approach that is similarly beginning to appear in the general literature on attention.

2. So far, the investigations concerning attention as a "top-down" process in reading have been based on "bottom-up" investigations (Hochbert, 1978; Mackworth, 1977).

The very conspicuous need for an investigation of "top-down" attentional processing using a "top-down" investigative approach

was noted and represents one of the major purposes of the present research.

The specific purpose of the present study, was to determine whether older disabled readers (grade seven students) rely upon "top-down" attention organizing strategies to the same extent as average readers (grade five students) and if differential instructional conditions to promote the self-regulation of such strategies would improve their reading proficiency.

HYPOTHESES

Recall Performance

Hypothesis 1
Over all experimental conditions, mean recall performance for both groups (average and reading disabled) will be positively related to level of importance of idea unit (i.e., level 1 < level 2 < level 3 < level 4).

Hypothesis 1-1
Mean recall of high idea units versus low level units will increase across experimental conditions for reading disabled students.

Hypothesis 1-2
Mean recall will be greater for average subjects as compared to reading disabled subjects only in the incidental experimental condition and not in the other three intentional conditions.

Hypothesis 1-3
Mean recall performance for reading disabled will increase across learning conditions (i.e., incidental < intentional < planned <intentional trained intentional).

Comprehension Performance

Hypothesis 2
Average readers will obtain a greater number of correct responses to comprehension questions than reading disabled in the incidental learning conditions and not in the other three intentional learning conditions.

Hypothesis 2-1

Correct responses to comprehension questions will increase across learning conditions for reading disabled subjects (i.e., incidental <intentional < planned intentional < trained intentional).

METHOD

Subjects

Average and disabled readers were examined in this study. The grade five (average readers) and grade seven (disabled readers) students were selected from elementary and junior high schools in the Edmonton Separate School System. Groups were selected and equated on the basis of IQ Scores and reading achievement scores on tests (Lorge-Thorndike Intelligence Test and Canadian Test of Basic Skills) that are routinely administered to all students in this school system. In addition, all subjects had to achieve a grade equivalent of at least 50 on the Schonell Graded Word Reading Test in order to be included in this study. The sample characteristics of the experimental groups were as follows:

SAMPLE	CHRONOLOGICAL AGE	LORGE-THORNDIKE NONVERBAL IQ	CTBS READING COMPREHENSION
60 Average readers	$\bar{x}$ = 11.5	$\bar{x}$ = 103.8	$\bar{x}$ = 5.04
35 female 35 male	(SD = .655)	(SD = 6.9)	(SD = .36)
60 disabled readers	$\bar{x}$ = 13.6	$\bar{x}$ = 100.5	$\bar{x}$ = 5.36
29 female 31 male	(SD = .723)	(SD = 7.5)	(SD = .31)

Subjects were randomly assigned to one of four experimental conditions (i.e., incidental, intentional, planned intentional, trained intentional) and each experimental group included 15 average and 15 disabled readers.

Design

There were two main dependent variables of interest in the comparisons between average and disabled readers. Total recall was calculated for each subject on the basis of "n" idea units out of a possible 59. These recall data were also categorized into "n" idea units at each level of importance. Recall performance differences were examined utilizing a 2 (groups) X 4 (learning conditions) X 4 (idea unit levels) analysis at variance with the mean percentage idea units recalled at each level as dependent measures.

The other major variable, comprehension, was calculated on the basis of "n" correct responses out of a possible 10. A 2 (groups) X 4 (learning conditions) factorial design was used, with the number of correctly answered comprehension questions as the dependent measure.

Materials

The Japanese folk tale, "The Dragon's Tears," used in several previous studies (Brown and Smiley, 1977, Brown, Smiley and Lawton, 1977, Smiley, Oakley, Worthen, Campione and Brown, 1977) was selected for use in this study. There are several reasons why the story was considered appropriate here. First, the study has been widely and successfully utilized with subjects at this grade level as well as with both good and poor readers. The story is broken down into 59 idea units which have been rated and tested for importance to the theme of the story. Therefore, recall protocols obtained from this research could be scored both for total number of idea units, as well as the importance level of the idea unit to the gist of the story. "The Dragon's Tears" is 390 words in length and has a reported Dale-Chall (1948) readability score of 5.2287, which makes it suitable reading material for subjects reading at a grade five level. In addition, the story content is both interesting and of a form which is highly familiar to students of this level.

Procedure

The experiment was carried out in the respective schools of the students. All subjects were individually tested in a room designated by the school principal, and were seated at a table facing the experimenter. The Schonell word identification test was first administered and if a grade equivalent of at least 5.0 was obtained, the experimental session continued. Instructions for the experimental task varied according to the learning condition and are summarized as follows:

Incidental Condition:
Subjects were instructed to silently read the experimental passage.

Intentional Condition:
Subjects were instructed to silently read the experimental passage and were informed of the recall requirement at task completion.

Planned Intentional:
Subjects were provided the same instruction as the intentional group as well as nine pre-task interview questions to induce the subject to adopt any self-generated meta-strategies to improve task recall and comprehension.

Trained Intentional:
Subjects were subjected to four forty-five minute training sessions in which a specific metacognitive reading strategy (an adapted version of the SQ3R approach outlined in Sargent, Huus, and Andresen, 1970) was taught, and practice was provided in self-regulating attention to the overall strategy during the silent reading of short passages. Prior to their reading of the experimental passage, subjects were provided the same instructions as the intentional group and then specifically told to use the SQ3R approach. After the experimenter read the appropriate condition instructions the two story cards were given to the subject to silently read.

Behavioral checks such as reading time, and behavioral evidence of metacognitive strategy usage (i.e., skimming through the story, looking away and attempting to recite events of the story) while performing the experimental task were noted on the subject's protocol sheet.

After the subject indicated that she/he had finished the story and was ready for recall, a tape recorder was switched on. Immediately following the verbal recall, the 10 comprehension questions were presented and answers were also tape recorded. The recall protocols for each subject were transcribed and subsequently rated by the experimenter. An inter-rater reliability procedure was carried out to assess the reliability of the scoring.

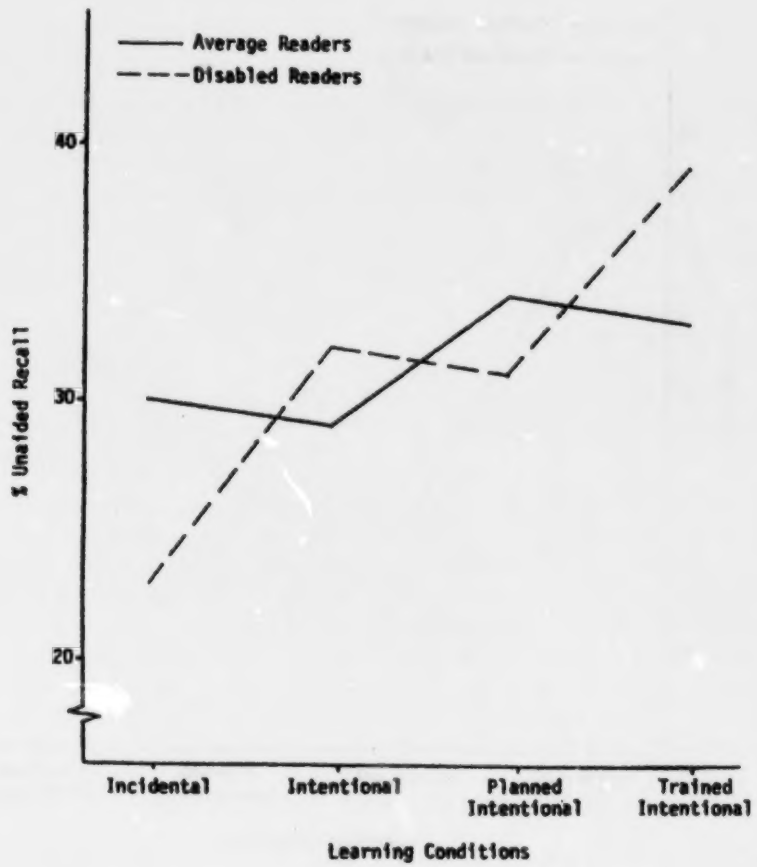

Figure 1

Recall Means of Groups x Conditions
(Collapsed over Idea Unit Levels)

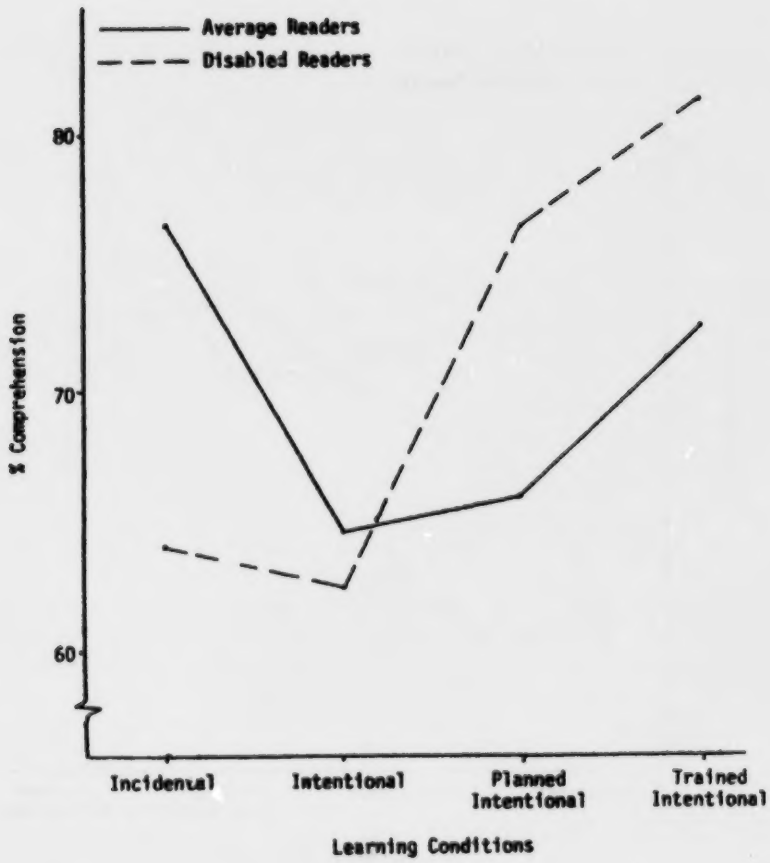

Figure 2

Comprehension Means of Groups x Conditions

RESULTS

Recall

A significant main effect for learning conditions ($F = 4.68$, $df = 3/112$, $p \leq .004$) was obtained as well as a significant interaction of groups x learning conditions ($F = 2.72$, $df = 3/112$, $p \leq .04$). These results are graphically depicted in Figure 1. Newman-Keuls tests on the means of the interaction indicate that whereas there was no appreciable difference in recall for average readers across learning conditions, the reading disabled show an interesting pattern of improvement across conditions. From incidental to trained intentional ($Q = 6.14$, $df = 112$, $p \leq .01$), from intentional to trained intentional ($Q = 3.58$, $df = 112$, $p \leq .05$), and from planned intentional to trained intentional ($Q = 3.09$, $df = 1/112$, $p \leq .05$) significant recall performance increases for disabled readers were indicated.

T-tests on group means for total idea units recalled within each condition were carried out, and using a one-tailed interpretation of the results, a marginally significant difference between groups was found in the incidental learning condition ($T = 1.56$, $df = 1/28$, $p \leq .06$) and a significant difference in the trained intentional learning condition ($T = 1.83$, $df = 1/28$, $p \leq .039$). Referring back to Figure 1, it can be seen that the recall performance of the disabled reader is well below that of the average readers in the incidental learning condition, and yet in the trained intentional condition, the disabled readers' recall is significantly better than average readers.

A highly significant main effect for levels was found ($F = 466.64$, $df = 3/336$, $p \leq .0000$), whereas no significant interactions between groups or conditions by idea unit levels was indicated. Multiple comparisons of idea unit level means using the Newman-Keuls procedure revealed a significantly greater amount of level 3 and level 4 idea units recalled, in comparison with levels 1 and 2 respectively; an increased amount of level 4 idea units recalled versus level 3, and no difference with respect to the amount of level 1 versus level 2 idea units recalled.

Comprehension

A significant main effect for learning condition ($F = 4.19$, $df = 3/112$, $p \leq .007$) and a significant interactive effect for learning conditions by groups ($F = 4.07$, $df = 3/112$, $p \leq .008$) was indicated. This interaction is graphed in Figure 2. In order to determine the specific nature of the groups x learning conditions interaction, the Newman-Keuls procedure was utilized. For average readers there were no significant difference in comprehension across conditions, although there was a notable decrement in performance in the intentional condition, in comparison with the incidental learning condition. In contrast to the average readers, the performance differences in comprehension for disabled readers across conditions were consistently positive. A significant improvement in comprehension was found in both the planned and trained intentional group over the incidental and intentional learning groups respectively.

For a comparison of means between groups in each experimental condition, separate T-tests were utilized. Using a one-tailed test-solution, significant differences between average and disabled readers in comprehension were apparent in the incidental condition ($T = 2.31$, $df = 1/28$, $p \leq .01$) in the planned intentional condition ($T = -1.92$, $df = 1/28$, $p \leq .03$) and in the trained intentional condition ($T = -1.97$, $df = 1/28$, $p \leq .02$). An examination of the graphic presentation of the group means (Figure 2) shows that the comprehension of the disabled readers was significantly lower in the incidental condition, with performance gains in both the planned and trained intentional conditions superior to the average groups.

DISCUSSION

There are a number of significant findings resulting from the present investigation. With respect to recall performance, it appears that the average and disabled readers, matched for reading level, are similar in their tendency to remember information that is most important to the overall story structure (i.e., level 3 and 4 idea units) and less likely to recall information that is less central to the story (i.e., level 1 and level 2 idea units). Other studies have shown that this tendency is apparent over a wide age-range of subjects (i.e., grade three to college level). Though Brown and Smiley (1977) have suggested that there are four hierarchically arranged levels of importance in story recall, the

results of the present study (i.e., level 1 = level 2 < level 3 <level 4) do not totally support their conclusions. An independent study by Martinez, Ghatala and Bell (1980) revealing a recall pattern similar to that of the present investigation, suggests that there may be only three distinct levels of importance in short story recall. This matter requires further investigation for clarification.

In a similar vein, it was noted that the baseline performance (i.e., incidental learning condition) of disabled readers was significantly lower than average readers, but the difference was only quantitative as the pattern of idea unit recall was similar for both groups. These results are contrary to those reported by Martinez, Ghatala and Bell (1980) and for Smiley, Oakley, Worthen, Campione and Brown (1977) who found that average readers recalled more level 3 and 4 idea units in comparison with disabled readers. The difference might be attributed to the use of reading level matching of average and disabled readers in the present study, versus age level matching in the other studies. A further investigation to examine average readers together with reading level matched and age level matched disabled readers would help to clarify this discrepancy.

Differential instructional conditions were found to be substantially beneficial for disabled readers. The initially inferior recall performance of the disabled readers in the incidental condition was improved to the extent of no difference between groups for the intentional and planned intentional conditions, and in the trained intentional condition the improvement was such that the recall of the disabled readers was significantly better than that of the average readers. These results support the notion that older disabled readers do have access to "top-down" attention organizing strategies but they do not tend to rely upon such in a reading situation. However, it does appear that older disabled readers can be instructed to self-adopt and self-regulate these strategies to improve reading recall. A follow-up study of the trained intentional group would further extend the present findings to determine if the strategy training can be maintained over a lengthy time period (i.e., five or six months).

In general, the idea unit paradigm appears to be a particularly useful instrument for the examination of variances in recall

performance. It appears flexible enough to accommodate a wide range of task, subject and context variables that influence the reading of text. With respect to the present study, evidence to support the notion of "cognitive" or "top-down" aspects of attention in the reading process was obtained. Though certain discrepancies of results reported here with previously reported data were identified, the paradigm appears to be sufficiently robust for continued use in future investigation.

Although a separate comprehension measure is not typically included in the levels of idea unit studies, experimenter devised comprehension questions were addressed to all subjects following their recall of the story in the present investigation. The inclusion of such a comprehension measure was found to be highly informative in the overall interpretation of the results. As was the case for recall, disabled readers were found to be significantly lower with respect to comprehension performance in comparison to average readers in the incidental condition. However, in contrast to the immediate improvement in recall for disabled readers in the intentional instruction condition, no improvement in comprehension was noted. In addition, whereas the recall improvement for the intentional condition was simply maintained for disabled readers under planned intentional conditions, a doubly significant improvement in comprehension was observed in this condition. Here it was found that disabled readers significantly improved their comprehension performance over their peers in the incidental condition, as well as over the average subjects in the planned intentional group. Finally, in the trained intentional condition doubly significant (i.e., across conditions and across groups) improvements in both recall and comprehension were observed for disabled readers.

These findings suggest that recall and comprehension are independent processes tht mutually affect overall reading proficiency. This distinction is not widely noted in the literature, though it would seem that the issue would be extremely important for both theoretical and applied considerations in future investigations. In a similar vein, the fact that major recall and comprehension performance increments for disabled readers were differentially observed across instructional conditions may be indicative of a functionally significant link between attentional self-regulation and recall and comprehension processes as they relate to reading proficiency. Again, the issue warrents further

exploration in future investigations. As a start, researchers could simply add a comprehension component to their studies of story recall, as was done in the present investigation.

The performance of average readers in this study was of interest in that no significant recall or comprehension performance differences were noted across differential instructional conditions. This result is supportive of the initial contention that top-down attention strategies are already well developed in the average grade five reader, and that such are probably routinely applied in any reading situation. It was, however, noted that there was a decrement in recall performance for intentional and planned intentional conditions as well as in comprehension performance in the intentional condition. It would therefore seem that the imposition of an externally given goal tends to disrupt or interfere with incidentally efficient strategies that are normally adopted by average grade five readers, and this results in a reduction of performance. Meacham (1971) has advanced a discussion to this effect using Soviet studies of voluntary and involuntary memory as a basis for his arguments. Further study of this phenomenon, across a variety of tasks, subjects and age levels would help to gain insight into this seemingly potentially fruitful area of investigation.

The pre-task interview data, behavioral observation data, and the passage reading time data were of limited use in the present investigation, and would appear most effective as secondary sources of information in future studies of this type.

Taken together, the present results have major implications for further models of attention, the results of this study do appear to provide support for the notion of cognitively regulated attention processing. The manipulation of instructional conditions for the promotion of such, led to substantial increments in the recall and comprehension performance of disabled readers following a silent reading task. By using a "cognitive" or "top-down" approach to investigate attentional processes in reading, insight to the following critical questions was obtained in this study:

To what extent can and does the subject take an active part in his/her self-regulation of attentional abilities and strategies in the reading process and what is the instructional context that

promotes the subject's maximal utilization of available attentional abilities.

It was additionally noted that research efforts regarding the study of the reading process, can be extended through the examination of special groups, such as the reading disabled. Within the context of the present study, the inclusion of a carefully defined subgroup of disabled readers most importantly provided evidence to suggest that "top-down" attentional processing might be a key factor for reading proficiency. Moreover, insight as to how readers with attentional regulation problems in reading can be remediated was obtained; as well as some evidence to suggest that differential learning conditions can differentially affect the recall and comprehension abilities of readers with attentional deficits.

It was concluded that future general models of attention, as well as specific models of attentional processes in reading, should include the "cognitive" or "self-regulative" aspects of attention, in addition to traditional components. Accordingly, there is a need for the establishment of a generative research base to thoroughly explore how the cognitive aspects of attention operate, and how these relate to overall attentional proficiency. Further work is also needed to explore how attention processes affect the recall versus comprehension of stories in reading. Steps by which this can be achieved are outlined.

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Occasional Papers

No.6

THE NEGATIVE STANCE: A CHALLENGE TO THE PROCESS OF RENEWAL

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In taking the "negative position" in this paper I do not intend to dwell on what is bad about in-service - the common criticisms are well known: there is occasional excellence, but overall there is mediocrity, lack of relevance, boring presentations, top-down imposition, one-shot experiences and a failure to relate to the real life of the classroom. Instead, in taking the "negative position", I want to address the question of what sorts of things stand in our way as we struggle to improve and perfect the process of renewal in the teaching profession.

The paper has three sections, beginning with a discussion of two underlying premises. Then there is an outline of some of the barriers that are known to impede the development of effective in-service (or to put it another way, factors known through research to be conducive to high quality in service). The paper concludes with some comments on the bureaucratic and organizational structures that seem to me to impede renewal for people in the teaching profession.

My first premise relates to the work "renewal", the theme of this conference. Historically, my views on in-service have shifted from seeing "renewal" and "in-service" as two notes in the same chord. When I actually begin to do in-service work with teachers, I was very much a "renewal person". Renewal spoke to me of vitality and

love of teaching a passion to keep learning more, a delight in discovering new and better ways to do things with students, a willingness to dare to do things, an eagerness to share with other teachers the things learned and tried. I of course knew that teaching was not like that every minute but I wanted to foster that sort of spirit. In the early seventies I worked with the Lighthouse Learning Project at the Atlantic Institute of Education and we were interested in working with those teachers who were taking the initiative in their own renewal. We encouraged them, put them in touch with one another, held mini-conferences and workshops, helped them find materials and so on. In keeping with the spirit of times we avoided tight organizational procedures, and we counted on what we called the "ripple effect", our model, as we articulated it, was that teachers doing exciting things would "turn on" other teachers around them, so you would see teachers slowly changing and revitalizing one another, teachers growing at their own speed, in their own ways and when they were ready. Thus it was that for me at that time renewal was a far cry from traditional in-service: renewal was engaging and exhilarating while in-service as I had experienced it as a teacher was often boring a day that came once or twice a year, a nice break, which at best taught me one or two new things, but which basically left me unaffected.

Since that time I have shifted. Maybe it's age. Maybe it's experience. Maybe it's the times. But I realize now that things need to be done somewhat more systematically. The notion of "ripple effect" was an exciting one, but the process was very slow. The many exemplary teachers we worked with are still active and wonderful teachers, a few more have joined their ranks, some have 'burned out'. What is important about those early times for me now is that despite my recognition of the need for more systematic work, my Lighthouse days make me determined to retain the vitality of what we call "renewal". My shift in orientation, then, is not a shift from individual renewal to systematized in-service, nor do I see one as necessarily the denial of the other. What I seek at this point is a way of nurturing and maintaining renewal through the systematic work of in-service processes. This shift in my thinking parallels in a variety of ways shifts that we might generally point to in the current approaches to in-service, shifts that are tendencies not fait accomplis.

These general tendencies in approaches to in-service seem to me to be three-fold. There are shifts:

(i) from individual teachers doing as they wish, taking courses as they choose, picking whatever interests them at smorgasbord conferences with ad hoc choices to each teacher being expected to actually develop a plan for his or her own professional growth. Increasingly it is understood that as part of teachers' evaluation and development they should be encouraged to discuss individual growth plans with their principal or supervisor. This is tied to the recognition that in-service education is a necessary and vital continuation of pre-service education. The trend is that it be planned and sequential rather than idiosyncratic and ad hoc.

(ii) from in-service being taken up at the level of individual teacher related to a teacher's individual needs and interests and professional development plans to in-service being organized terms of collectivities of teachers, teachers working together on common sets of problems or concerns. This might be school-based or subject-based, but it is a collective approach rather than an individual approach.

(iii) from individual institutions such as universities (or more likely, individual university professors), school boards, teachers' federations and ministries doing things on their own to institutional cooperation. Institutions are starting to cooperate, and there are committees and conferences from one end of the country to another that bear witness to this shift. So the shifts in the past few years have been: -idiosyncratic to planned,
-individual to collective,
-isolation to cooperation.

All of this is happening in the context of the times: tighter planning and budgeting procedures in school systems, in ministries of education, and universities, a time of increased demands for accountability; a time of increasing centralization--a time of general fiscal squeeze in the field of education. Organized long-range in-service, collective and cooperative approaches all demand increased planning, and have to be done with an eye to objectives that can be evaluated, using procedures that can be seen to be well laid out What can be seen here, if we return to my earlier discussion contrasting "renewal" in teacher education with my negative connotations about in-service, is that there really has been a shift, rather, we want to work towards a synthesis. All through our deliberations at this conference, as we discuss the things we know about more systematic in-service, a central concern

for me, and I hope for you is to not lose sight of the enriching, vital and passionate professional growth that the term "renewal" speaks of. Can we be systematically renewing?

My second underlying premise is that we are concerned about in-service because we want to make some sort of difference in classroom life (although not of course, seeking change for the sake of change). We must not, in the eagerness of talking of the spirit of renewal and mechanics of in-service, lose sight of the why of doing in-service - that it have some sort of positive effect on what goes on in classrooms. Parenthetically, I might add that when I speak of making a difference in classrooms, I am not just talking about specific instructional things a teacher might learn. All sorts of things can make a difference in classroom life: a school staff that learns how to deal with interpersonal relations, or to cope with stress or to relate better with parents will experience a spill-over effect in the classroom.

If we always see as the rationale behind our discussions a true concern to make a difference, if we keep always in sight that we want classrooms to be the focus then we will avoid what seems to me to be an enormous trap just waiting to capture us. It gapes before us eagerly wanting to lure us in. The danger is that we may involve ourselves in all sorts of activities that appear to be more and better professional development, we may organize efforts that can be pointed to and be accounted for as money well spent on programme planning and professional development--but it might be only that --time and money spent more systematically, with no results in the classroom. There has been a lot written about how to organize for effective professional development and I think we must always attend very carefully to what we really want to happen. We must keep in mind the ultimate goal as we try to confront some of the organizational and processual variables relating to effective in-service.

In-service Education: What we Know

It is true that during the past two decades much more has been learned about the factors tht enter into successful efforts at change and renewal among teachers and in schools. Every publication these days has some article pulling together the best in-service wisdom. This literature demonstrates clearly that the difficulties in changing in classroom practice through in-service work stem not from the intransigence of teachers (nor the

incompetence of those doing the professional development), but rather from the complexities of doing in-service. The barriers ten years ago were knowledge barriers, now, the barriers are organizational. How do we put in place an organization of professional development that takes into account what we know? What precisely do we know?

This section of the paper explores the knowledge developed over the past decade about providing quality in-service. We shall look both at what we know and at how these "what we knows" actually pose more difficulties for us. This knowledge has been clustered in three general groups. Other people might organize the knowledge differently, and certainly could add more.

The first cluster of knowledge can be summarized broadly in the following statement: we know that the richness of the professional development environment differs from school to school and from teacher to teacher. We are talking here (and I borrow from Bruce Joyce) of capacity to innovate, the school ethos, and school ecology, that intangible something that makes a school either a fertile or infertile field for professional development. A school system or a provincial ministry of education or a teachers' federation can put in place high quality in-service provision - and some schools will take off and others will remain virtually moribund even when the material conditions seem the same (location and size of school. age/experience levels of teachers etc.).

We can similarly speak of an individual teacher's capacity to innovate. Different teachers for some reason or other take different things from the environment. So, it might be that in a particular school system there might exist a wide range of professional development provisions: funding for special projects, teachers' centres, regular workshops, weekend institutes, summer school programmes and so on, and some teachers take off, while others remain aloof, and still others, immoveable.

Each of us knows school and individual teachers we could point to as having an enormous capacity to innovate. There are schools I know where the staffroom talk has a particular character, where sharing ideas is something teachers regularly do, where visiting one another's classrooms is a normal occurrence where the relationship between principal and teacher is one of openness and interest, and where new teachers are not automatically given the

worst schedule and the "difficult students". Similarly, we know particular instances of individual teachers whose lives evince a rich environment for professional development.

All of this must be understood in each instance and reflected in in-service provisions. In some cases renewal is merely a matter of putting things in place, while in others it is a matter of first developing a capacity to innovate so that when the provisioning is in place it will be taken up. Clearly it is easier to do the former, it is easier to put the provisions in place than it is to work with a school to develop its capacity to innovate, to develop its fertility as an environment for professional development. There is a danger of neglecting this latter task, which ultimately means that professional development provisions will get picked up by only a few. (We might of course ask whether that is all we want).

So when we plan more systematic and cooperative in-service ventures, we are going to have to look carefully at it, and ask which schools will take this up and which schools and teachers will be left behind. When we develop in-service guidelines, we will have to ask whether or not we are putting together models that boost the capacity to innovate, that nurture an environment for professional development. In this context, one of the things we might consider as administrators and teacher educators is the extent to which our efforts at in-service might be better concerned with creating good professional development environment than with providing an endless array of program options.

An immediate question arises regarding this general cluster of factors: how do those organizing in-service plans become familiar with the conditions in a particular school or with particular teachers? How do we develop the capacity for seeing and understanding it? And how do we go about fostering a fertile professional development environment? What kinds of skills and knowledge do we as professional development leaders need?

The second cluster of things we know has to do with adult learning. Overall, we know that the degree of learning that actually results in changes in what goes on in classrooms best occurs over an extended time frame and requires a progression through several levels of training that reflect the variety of ways adults learn at each level. Certainly, to talk about time-frame and levels of

training depends on the nature of the professional growth wanted fine-tuning is different from developing a whole new repertoire. If we are talking about a major change, we must plan for a two-to five-year process. In making a time-plan we must consider what kind of impact is wanted. Is the in-service session aimed at basically making people aware of some new ideas? Or is it to teach them concepts lying behind a particular new set of skills? Or is it to actually get them to learn the skills? Or is it to get them to use a new set of skills in the classroom, applying them in new and different situations? Depending on the level of impact, you would want to organize differing teaching processes in the in-service sessions - from merely presenting theory, to modelling and demonstrating, to supervised simulated practice (through micro-teaching), to feedback on actual classroom application. If you want the highest level of impact (i.e. classroom application in variety of situations) you need all the levels of training, and if levels are left out, the impact is lessened, there is less effect on classroom practice.

We then must add to this the further complicating factor that as learners, adults display wider sets of individual differences than do children. We all are concerned with individual differences in children, yet we often treat adults as though they all learned in the same way. I just finished reading a study where ten women in their thirties were interviewed about such things as what got in the way of their learning, what motivated them to learn, how they preferred to learn (in a group or alone, with a leader or entirely on their own), what kind of leader they liked, and so on. The differences in their responses were astonishing and really made me reflect on some of the assumptions I make about the homogeneity of adult learners when I put together workshops. We might add here that adults are able to reflect upon their preferred learning styles and this should be even more true in our in-service work given that teachers themselves are experts in the matter of learning. We should learn to build this into in-service provisions.

Clearly this cluster of information about 'levels of training' and 'styles of learning' is only one piece of the whole renewal or professional development process. Yet even this little piece requires a lot of thinking through on the part of those engaged in in-service provisioning. As a piece of knowledge yes, it is useful, but in practice it means a lot more work. What kind of

impact do we want with a given innovation? What kind of training level is needed? Who are the people we are working with and how do their learning styles, needs and interests coincide? And how do we as leaders, get to know all this? Again we find ourselves faced with this issue of the knowledge and skills of those providing in-service.

The third cluster of factors is a familiar set, I think, for any of you who have been involved in re-thinking how we do in-service. To summarize this piece of knowledge, we might say that the more successful efforts at in-service are school-focussed, job-embedded, involving teachers in needs assessment, programme planning, implementation, follow-up and evaluation, the process is one of mutual adaption and assumes an understanding of the practical thinking and decision-making that teachers use in their day-to-day work. The principal's role is central.

Just a few comments here on some of the problems "tossed up" by this knowledge. To talk of school-focussed means getting teachers and principals to work collectively, which has not been the practice in teaching, teaching has traditionally been an individual and isolated profession. And to talk of school-focussed also means the provisioning has to take into account the character of the whole school. Further if we speak of involving teachers, we must see this as a role change. If teachers are to work as equal partners with ministry of education officials and board consultants and faculty members from teachers' colleges, all of these people must re-think their roles and put this re-thinking into practice. I might note here - (and it is a crucial point) - that this sort of change to cooperative work among people who in their traditional roles have been in different hierarchical positions is in itself an innovation and needs to be introduced, taught, modelled and developed over time just as any other innovative procedure would be implemented. Another note on this point about involving teachers: all teachers need to be involved in planning for and thinking about their professional development. It is not just a matter of putting a few teachers on a planning committee.

There are problems tossed up when we say needs assessments should be done. To raise questions about needs assessment is not to suggest that they should be abandoned. But there are, for example, problems with questionnaires. I am sure many of you have a certain experience when you fill out questionnaires yourself - either the

question is not asked in quite the right way, or the response you would have ticked is not one of the choices, or you desperately want to add qualifiers to your checked responses. This is one problem with certain types of needs assessments. Furthermore needs assessment questionnaires generally do not explore such central issues as the capacity to innovate. A solution here might be to do needs assessment through interviews but this too is a solution with its own problems: people in their talk are quite vague, and express widely disparate views of what they want in professional development. In order to conduct effective needs assessments, we must develop the skills needed to look at ourselves as teachers, to be self-reflective about our practice, to analyze our performance, our skills and our knowledge. We as teachers need to be able to do this for ourselves, and we, as teachers of teachers, need to get better at enabling people to reflect on their own teaching.

So there are these three broad constellations of things we know about: capacity to innovate, processes of adult learning, and factors conducive to effective implementation of innovation. To complicate matters, given all that we know about these other factors, there is still to be considered the endless dynamism of the factors and their interaction. The factors cannot be treated as separate and sequential, but must be understood to be intertwined in a variety of ways over time. Furthermore, the factors must be understood to operate at every level expansion and improvement in in-service involves changes in practice, concerns about capacity to innovate, and attention to preferred learning styles, not only among teachers, but among ministry officials and consultants, school system supervisors and administrators, teacher educators and teachers' federation officers. Once we have recognized the variety of factors and their complexity, we must realize that any systematized plan that takes into account all that we know simply cannot be applied in general without regard for local and particular factors at all levels of organization involved.

Putting Into Practice What We Know

What has struck me over the past ten years is that the more we know, the more the complexities are revealed. Increasingly, the fundamental problems and contradictions are displayed for us. I want to argue as a point for debate that neither the school system's organiztional stuctures nor the ways teachers' work

processes are organized make it easy to put in place the kind of professional development plans which try to incorporate the factors research on in-service has shown to us. The same can be said of the organizational structures and work processes of those involved in ministries of education and in teacher education institutions.

To illustate this, one instance will be described: a project involving one elementary school, an external advisor and a school system consultant in a three-year plan for in-service in a particular subject area. Let us look at the school system example. I am changing a few of the 'facts', but the basic process is as I describe it. This takes place in an elementary school with twenty to twenty-five teachers. It is quite a new school. Two consultants are involved, one a subject-area specialist from the school system, the other an expert from an outside educational institution. In the fall of 1981, the school plans to begin a three-year process of in-service education in the teaching of Social Studies.

What is central to this project is that the consultants, the principal and the staff have spent one whole year thinking through the proposal, deciding whether to go ahead with it, and working out how it would operate. And in this year-long process, many things have gone on that are essential to the potential success of the project. The first is the process of developing trust among the teachers, between the teachers and the principal, between the teachers and the consultants. This was a combination of growing to respect one another's expertise, of realizing that the consultants could be depended upon, and feeling safe to speak one's mind. Secondly, it was a process of teachers overcoming their doubts and misgivings, their reluctance to commit themselves to the project. They were asking themselves - "Is this what I should be doing? I really feel the need to work on my Reading Programme. How can I do both?" These kinds of concerns were sorted out by discussing the varieties of ways that needs related to the Reading Programme could be incorporated into the overall plan. To overcome doubt and misgiving also meant developing the confidence to openly express reservations with the principal and the consultants. We must remember when we embark on such projects that positions of authority make teachers reticent to express doubts, for doubts sometimes can be construed as lack of confidence or lack of interest in professional improvement. The process of overcoming doubts also meant overcoming hesitations about having someone come

into one's classrooms to demonstrate to observe, and to give feedback.

During this year of deliberation, the group arrived at a decision to devote as many as possible of their free in-service days to this project over the subsequent three years, organizing it in what seems to me to be a particularly creative way: in the first year, the Primary to Threes get more in-service days than normal, with the Fours to Sixes covering their classes and having fewer professional development days. This is to be reversed in the second year. We might note here that the plan for professional development is not limited to the official allotment of in-service days. Professional development is considered to be going on in a far broader framework, for it includes trying things in the classroom observing demonstration lessons in their classrooms, being observed and having feedback sessions, attending after school meetings and so on. It seems to me to be imperative that we get away from seeing in-service as only that which goes on on professional development days as allocated in the Contract. These allotted days should in fact be only one of many components of a coherent plan for professional development.

You will no doubt have noted that to focus a school's professional development plans on one particular subject area for three years means that there would have had to be an agreement from other consultants in the school system--the Language Arts, the Math and the Science consultants. In part this agreement can be achieved by showing how the skills developed in the in-service programme would spill over into other aspects of the curriculum. In part also, agreement was reached by working out ways other curriculum experts could have input (an obvious example would be Reading in the content of Social Studies).

In contemplating this process, you can get an inkling of the kinds of skills these consultants had: organizing skills; skills of discussions and decision-making; being facilitators and fostering such skills in other participants, skills of clinical supervision necessary for observing teachers experimenting with aspects of the new Social Studies programme; and excellent knowledge of the subject area itself. Furthermore, the consultants had to be skilled and energetic workshop leaders, as well as competent classroom teachers so that they could do demonstration lessons. As well, many of the teachers in this school already had a number of

these skills themselves, and were workshop leaders in their own right. so that there was a wealth of resources in this particular school. But all these skills rolled together are difficult to come by in one or two people. We all know some consultants who have most of these skills, but there are many who do not, and this has to be of serious concern to those of us concerned with the competence of those whose task it is to lead teachers in their professional development planning.

Now, I've just given you a taste of that project, going on in one school in an urban system. It is a pilot project, and it looks as though it is going to be an exciting and productive experience. But then what? How do we go about putting this whole process in place of other schools? Some schools might, for example, justifiably require more than one year to work through the initial problems of trust and commitment, especially if their 'capacity to innovate' is low. How do we organize a whole school system so that schools develop three-to-four-year professional development plans? Where do we get the consultants with all the kinds of skills and knowledge referred to earlier? Might it be possible to do two or three pilots in a school system, with the aim that out of the pilot schools might emerge after three years a handful of teachers who could act as consultants, who could be seconded for a time to engage in this same process in other schools, either within the same school system or with another board?

To do this sort of thing means that we have to accept that it takes time. We must develop long-term plans with long-term funding commitments. There really is no rush, it seems to me-or rather, there is a rush to begin thinking and planning but the process will only succeed if people recognize and build into the plans the long-term nature of anyworthwhile large-scale project. Of course, we do need to ask how much of our in-service effort needs to be developed at this kind of intensive, long-term level. How does a school system decide what aspects of long-term in-service it wants to put in place?

You will notice here that I am talking about the needs and priorities of a system. Perhaps a school system might work out for its elementary schools, for example, what the priorities are over the next five years, and then expect each school to develop ways of dealing with these priorities both in the sequence and in the depth most suitable to that school.

But individual schools too have particular needs, some to do with the community they serve, some to do with what we earlier called the professional development environment, the capacity to innovate, and so on. How do school needs mesh with system needs? How do we systematize a flexibility here?

And then we can add another level of problem. What happens when a provincial ministry of education puts out new guidelines for teaching, let us say, Mathematics in elementary school and expects every school system to use four professional development days in the next two years to implement it? What happens to the priorities of school systems and individual schools in such a case? Even worse is what happened in one province a few years ago, when within a short period there were new elementary Mathematics guidelines, Social Studies guidelines and Health guidelines, and teachers were being given in-service workshops in all these areas. The various provincial curriculum consultants knew full well that this was an overload and was not a sensible way to approach implementation, but given the requirements of their jobs, --the time-lines, the budget forecasts, the need to produce results quickly and within the budget year--all of them were expected to 'do' the implementing, or to set it in motion at least, over a two-year period.

We have to really ask ourselves how to mesh all three levels of need and priorities. And how do people on the front line cope with bureaucratic imperatives and managerial perspectives (efficiency, speed, time-lines, budgeting, evaluation and accountability) at the same time as they develop plans in terms of the local and particular requirements of each school or groups of teachers, with the need to do things over the long-term at the pace required by the particular group and the circumstances that group find itself in?

We might also have to ask, given municipal pressures for school boards to make budget cuts (and increasingly so every year), is it even possible to do long-term planning? Can we actually think and act in these new and more productive sorts of ways? Is the present environment conducive to putting in place the factors that we know foster effective in-service? Or are all the barriers that were discussed in the earlier section going to remain firmly and resolutely in place? Some creative thinking needs to go on, and it is people like yourselves who have to do this.

We all must do work within our particular institutions to discuss with our colleagues what is known about professional development. School board members need to know. Principals need to know. Parents need to know. The general public needs to know. We have an educating task before us, in terms of changing administrative guidelines, and in terms of training ourselves and people in similar positions in the skills and knowlege necessary for the kind of professional development that truly might be called renewal.

NOTES

1. See Cassivi, D. Teacher Education for Self-Reliance: The Lighthouse learning Program-Report and Reflections. Halifax: Atlantic Institute of Education, 1975.

2. See Fullan, M. and Pomfret A. Research on curriculum and instruction implementation. Review of Educational Research 47(1) 1977, pp. 335-397. See also Wideen, M. and Hopkins, D. In-service: A Means of Progess in Tough Times. Conference Proceedings, Simon Fraser University, May 1979.

3. See Joyce, B. In-service: New perspectives on an old term. In Wideen and Hopkins, op. cit., pp. 1-30.

4. See, for example Kidd, J.R. How adults learn. New York: Association Press, 1973, Knowles, M. The adult learner: A neglected species. Houston: Gulf Publishing, 1973, Knox, A.B. Adult development and learning. San Francisco: Jossey-Bass, 1977.

5. See Joyce, cited above.

6. Myers, C. Women and learning. Unpublished paper, Department of Adult Education, OISE, June 1981.

7. See Fullan, above. See also Bolam, R. Priorities in INSET: An international perspective. In Wideen and Hopkins, op. cit., pp. 39-63.

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Occasional Papers

NO. 7

EXTRACURRICULAR MATHEMATICS: INCENTIVE FOR THE TALENTED
Harold Don Allen, FCCT

A former member of National Council, Dr. Allen has adapted for sharing as a CCT Occasional Paper notes from his presentation at the Fourth World Conference on Gifted and Talented Children. A 22-year CCT member, Don worked with a secondary school mathematics club at The High School of Montreal in the 1950's and brought the first Mu Alpha Theta chapter to Canada (Northmount high School, Montreal) after 1960. He currently serves as Editor-in-Chief of the Mu Alpha Theta publication, The Mathematical Log.

The extracurricular, so-called, in one form or another and to varying purpose and degree, has roots deep in Western education. The playing field, the track meet, school dramatics, oratory and debating, singing and instrumental music, student publications, and sundry "clubs" of an academic, special interest, or socal nature all developed in recognition of and in response to a diversity of inclinations and needs. Mathematics, as elective extracurricular activity, has early origins on this Continent, I suggest, but the main thrust of its organized development, significantly, has been in the last 25-30 years.

Mathematics, among school subjects has, I submit, a particular ability, at whatever level, to capture the imigination, challenge, occupy, and develop the abler student. (One finds Shoesmith, a mathematics club innovator, eloquent on this point as early as 1933.) At secondary and even upper elementary school level, however, it may be in individualized and small-group effort, beyond the strictly curricular, that this challenge is most felt. Accordingly, for the gifted and talented among today's youth (though, to an extent potentially for all)

the growth and elaboration of the school mathematics club, mathematics day, mathematics fair, and individual and team mathematics competition, would seem to be, and are, of disproportionate educational significance.

Early instances of mathematics-related activity extending beyond the schoolroom exercise can be traced to the bygone era of spelling bees and other curriculum-related interschool and intercommunity rivalry, and involve the "challenge question," as it was commonly known. A mathematical "problem," "practical" or otherwise,would be attempted and solved by one class or school, then sent to another as a challenge. Quite possibly, parents and others in the community became involved. One accessible source of such problems would be the miscellaneous, sundry, or promiscuous exercises which frequently served to conclude school Arithmetics of this period. Thus, the spirit of the challenge question is captured in such nineteenth century "word problems" as these three--the first from Frederick Emerson, North American Arithmetic (Boston, 1837):

> If 12 oxen eat up 3 1/2 acres of grass in 4 weeks, and 21 oxen eat up 10 acres in 9 weeks, how many oxen will eat up 24 acres in 18 weeks; the grass being at first equal on every acre, and growing uniformly?

the second from Orlando Blanchard, Theoretical and Practical Arithmetic (Cazenovia, N.B., 1854):

> A cylinder being 3 feet in diameter and 20 feet high, how long is the thread wound spirally about it, so as to encircle it 10 1/2 times in ascending from the base to the top?

and the third from Benjamin Greenleaf, National Arithmetic (Boston, 1867):

> A servant draws off a gallon on each day, for 20 days, from a cask containing 10 gallons of wine, each time supplying the deficiency by the addition of a gallon of water; and then, to escape detection, he again draws off 20 gallons, supplying the deficiency each time by a gallon of wine. How much water still remains in the cast?

Still other "challenges" no doubt arose from problems "making the rounds" at the time, much as my student have labored over this elementary but difficult question of more recent origin (see Huff, 1977):

> Three routes link towns A and B. The shortest is direct, in a straight line, and a 30 minute drive. The second route is by way of town X, to one side of AB, over straight roads from A to X, and

from X to B. This route takes 35 minutes. The third route is by way of town Y, to the other side of AB, over straight roads from A to Y and from Y to B. This route takes 40 minutes. X and Y are both 25 km from town B, and roads from X and Y meet at B in (to keep the mathematics simple) a right angle. Find the speed at which the vehicle is being driven.

The school mathematics club is a phenomenon of this century, but a search of the literature confirms that successful clubs have been in active existence for more than 75 years. "To study certain interesting matters connected with mathematics which do not properly find a place in the usual classroom work," the first such club was established at Shattuck School, a private school in Faribault, Minnesota, in 1903 (Newhall, 1911, p. 500). Other such clubs have adopted, or commentators have cited, markedly similar aims, "to round out and supplement the mathematics courses in the high school (Russell and others, 1924); "to allow the pupil to explore and discover...the many interesting and worthwhile pleasures" associated with mathematics, a greater interest in it, and a broader understanding of the subject that can be secured in regular classroom work (Steward, 1930); and (an ambitious but worthy extrapolation) "to bridge the gap between text book study and actual application" (Sweedler, 1936).

Although a modest upsurge in interest in school mathematics clubs is to be sensed in the years immediately following World War II (see, for example, Owen, 1952), the elaboration of school contests and interschool meetings had not yet begun. A statement of mathematics club objectives from this period (Boyd, 1953) underlines needs of society and the potential of the abler secondary student: "to inspire and develop the capable student toward creative research in mathematics" and to familiarize the student with fundamental branches of mathematics "with the view in mind of possibly motivating that student to pursue subsequently this branch of knowledge on a professional level, thus, perhaps alleviating our shortage of mathematicians."

For Americans in particular, the late 1950's, the dawn of the space age, was characterized (it will be recalled) by markedly renewed interest and concern relating to school mathematics and science "electives" as such and to imaginative approaches to the identification, motivation and development of mathematical and scientific talent. Phenomenal growth in school mathematics clubs,

mathematics and science fairs, and regional and national contests and competitions dates from this period. Already solidly established and enjoying institutional support of the American mathematics and mathematics education communities, Mu Alpha Theta (M A Th), the national organization of secondary school and junior college mathematics clubs, was in a unique position to provide necessary and welcome leadership and coordination. Subsequent development of school mathematics clubs in North America (and, to an extent, in English-speaking areas abroad)accordingly may be identified in the main with the growth and maturation of Mu Alpha Theta, its publications, services, and regional and national activities.

"To engender keener interest in mathematics, to develop sound scholarship in the subject and promote enjoyment of the subject among high school and junior college students" were the ambitious but wholly praise-worth "aims" of Mu Alpha Theta when its Constitution appeared in The Mathematics Teacher in May 1957. The co-sponsorship of The Mathematical Association of America and The National Council of Teachers of Mathematics was noted by Mu Alpha Theta at its inception and continues to the present time, extending to representation on the Mu Alpha Theta governing board.

As a national society of mathematics clubs, Mu Alpha Theta has exerted leadership in school extracurricular mathematics primarily at two levels, the chapter (there currently are 1200) and the individual member (presently numbering 27,000). Chapter affiliation in Mu Alpha Theta is granted a school or college club only after investigation and approval of the institutional mathematics program and of the mathematics qualification of faculty. Correspondingly, in its criteria for individual membership at national level, Mu Alpha Theta functions somewhat as a shool mathematics honour society. Minimum standards of general scholarship and of mathematics coursework and attainment are stipulated in the national constitution. Individual chapters may set even higher standards before recommending a candidate for full membership. Associate membership typically is accorded interested students who are working satisfactorily toward national minimum requirements.

To the school mathematics club, its faculty sponsor, and its student executive and membership, Mu Alpha Theta currently provides a wide range of support and services. A publication (currently quarterly), The Mathematical Log, sent in bulk to chapters, offers expository

writing, problems and challenges, program ideas, opinions, and news and photographs of national, regional, chapters, sponsor, and student activities. Also, affording the exceptional student a unique opportunity to publish and share mathematical findings of general interest, occasional collections of student papers are edited and released in collaboration with The National Council of Teachers of Mathematics, 1973); and a diversity of more specific, mathematics-related publications, such as Richard V. Andree and Josephine Andree, Logic Unlocks. (A well-known writing team, the Andrees were the driving force behind the establishment and early development of Mu Alpha Theta.) Chapter charters, individual membership certificates, membership cards, club banners, patches, seals, and jewelry--items popular with students--also are available from national office. Since 1968, national conventions of Mu Alpha Theta have been held on United States university campuses during the summer vacation period, each attracting several hundred students and sponsors. Support also has been given by national office to mathematics contests and to regional, state, and local Mu Alpha Theta gatherings.

No one formula has characterized the successful school mathematics club. Some Mu Alpha Theta chapters have functioned virtually as honour societies, according recognition to top mathematics students in each graduating class. Other chapters have been strongly "service" oriented, providing tutoring, organizing mathematics field days, contests, and other events, and raising funds to send "math teams" to state and regional competitions. The heart of most clubs' activity has been weekly to monthly meetings of full and associate members, approaches to a successful club meeting also being richly diverse.

Accordingly, what are the types of mathematics club programs most likely to be popular at secondary school or junior college level? Faculty sponsors have been giving careful consideration to this question since such clubs were begun on this continent, early in the present century. Their conclusions have little changed with the years. In his pioneer article in School Science and Mathematics (1911), Newhall described in considerable detail a variety of activities and approaches, giving more extended attention (1916) to the aptness of a range of topics and questions from recreational mathematics. Other early commentators on school extracurricular mathematics have included Snell (1915), Shoesmith (1916), Webster (1917), Wheeler (1923), and Reed (1925)--Reed also providing a comprehensive overview of the scattered literature to that time. Worthwhile extensions and

bibliographies subsequently were produced by Hoag (1931) and Anning (1933). Other sources of useful "math club" ideas have included Sawyer (ca. 1960), Ransom (1961), Dalton (on student-presented programs, 1966); also the Mu Alpha Theta "handbook" and "topics" publications, and, for some time, the "Clubs" department of The Mathematics Teacher.

A conservative, but not necessarily unsuccessful, approach to club programming, one finds, has been for a teacher, commonly the faculty sponsor, to use meetings to develop, for interested students, a particular area of mathematics, beyond what could be done in the classroom. Such a sequence of presentations would typically be in introductory calculus, "modern mathematics," or computer programming, for a self- (or teacher-) selected, well-motivated group. On the other hand, from early writings (for example, Newhall, 1911), it is evident that faculty sponsors have been quick to recognize the importance of students "working up" and presenting their own material whenever possible--with assistance, as needed, from textbook, teacher, or library sources.

Among mathematics-related topics which students might "work up" and deliver, perennial favorites have included old algorithms, biographical notes on mathematicians, "magic" squares and cubes, logic, paradoxes and fallacies, cryptography, experimental probability, games of chance, finite geometries, non-euclidean geometries, recreational topology, linear programming, diophantine equations, continued fractions, nomograms, "outdoor" mathematics, and other mathematical applications and extensions. One finds as well a recurring preoccupation with topics at the limit of ready comprehension--the infinite, the infinitesimal, "imaginary" numbers, fourth and higher dimensions, properties of the tesseract.

"Activity"-type meetings also evidently have enjoyed continuing popularity--including construction and investigation of such mathematical models as the skeletal icosahedron and Mobius strip. Origami, with its relation to symmetry, also has sparked worthwhile investigative programs.

Skits, plays, poems and dialogues receive frequent mention in earlier "math club" literature. Such, we note, could be good fun and could verge on the outrageous. See, for example, Webster (1917), Reed (1925, pp. 351-58) and (more recently) Perry (1981). The outrageous continues. Leafing through old issues of The Mathematical Log I find

editor Margaret Maxfield (February 1966) defining sets to be "what mathematicians think makes the world go 'round," index to be "the way canasta cards come, "and paradox to be "two warves"; while editor Betty Lichtenberg (Spring 1980) gives tangents as "men that lie in the summer sun," parabolas as "two people who take turns rolling a ball at ten pins," and algebra as "mermaid unmentionable." Clearly, the present editor finds himself with some hard acts to follow.

Other reports of usual chapter activities have included a "mathematical party," wall and ceiling decorations and also table decorations being constructed by club members, a mathematics assembly, and also a mathematics banquet. For me, one of the high points of Mu Alpha Theta convention activity was the dinner at Stevens Point, WI (1978) which had as principal speaker a high school teacher who doubled as a professional magician. Considerable insight was offered into how mathematics underlies some elementary but impressive "magical" effects.

Competitive games such as nim, hex, and sprouts and solitaire games and activities such as tangrams (and its many variants), polyominoes, hexaflexagons, and life (comuter or pencil-and-paper version) are also of well demonstrated interest and value as club programs, as are a diversity of commercial puzzles and games having a mathematical foundation. The American magazine Games each November presents its "top hundred" games and puzzles from the United States market, and the mathematics relevance of many if not most is clearly evident.

Mathematical specialties, mathematical applications and career opportunities in mathematics and related field have been discussed at school mathematics club meetings by visiting lecturers from universities, business and industry. "Field trips" to computer centers, science museums, airports, industries, and similar facilities, also are reported to have been well received.

Individual competitiveness and team spirit both have provided a basis for worthwhile "math club" programs, with "problem solving" sessions and "math bowl" type playoffs. A source of particularly good problems has been the Annual High School Contest of the Mathematical Association of America. Mu Alpha Theta currently is a co-sponsor of this contest. Useful guidelines for "math bowl" organization are provided in Mu Alpha Theta's Handbook for Sponsors (1978 ed., pp. 50-58). Further, in current practice, no "math meet" is considered complete without a "Rubic's Cubathon" in which mentally and physically agile individuals

race one another and the clock to "restore" identically scrambled puzzle cubes.

Additional insight into the many kinds of mathematics that can effectively enrich the curricular and extracurricular may be gleaned from titles of Mathematical Log articles selected by a succession of editors. Thus, leafing through twenty years' issues, one chances upon, among many others, "The Semiotics of Mathematics" (Mathematical Log, 24:3, Spring 1980); "on the Importance of Uniqueness of Prime Factorization" (15:1, September 1970); "Mini-lessons in Number Theory" (13:3, April 1969); "Puzzles, Tricks, and Mathematical Reasoning" (15:3, April 1971); "Be a Lightening Calculator" (4:2, January 1961); "Symmetric Continued Fractions" (9:3a, April 1965); "The Pascal Triangle and All That" (15:2, December 1970); "Number Systems with Negative and Rational Bases" (17:1, September 1972); "Group Theory" (13:2, December 1968); "The Fundamental Theorem of Algebra" (10:3, April 1966); "Planar Ternary Rings" (15:1, September 1970); "Some Basic Properties of Functions" (14:1, September 1969); "Demonstrations of Archimedes" 27:3, February 1983); "The Consistency of Axiomatic Systems" (16:1, September 1971); "The Mathematical Concepts of Infinity" (12:1, September 1968); "Linear Programming" (8:2, February 1964); "Finite Geometry" (9:1, September 1964); "The right Angled Triangle" (11:2, Winter 1966-67); "Area of an Ellipse" (20:1, September 1975); "Al-Biruni, Regular Polygons, and Flowers" (27:1, October 1982); "Flexicells" (16:3, April 1972); "Spirolaterals" (21:2, January 1977); "Icosahedron Puzzle" (21:3, April 1977); "Polyhedral Lampshades" (26:1, Fall 1981); "A Glimpse of Topology" (11:2, Winter 1966-67); "Mobius Strip Variations" (27:2, December 1982); "A Problem in Cypher Analysis" (10:3, April 1966); "Opportunities in Quality Control" (12:3, Spring 1968); "A Glimpse into Game Theory" (18:1, September 1973); "An Elucidation of the Fourth Dimension" (10:2, February 1966); "Mathematics and Youth in the Last Third of the Twentieth Century" (13:1, September 1968). Accordingly, old Logs in school libraries and in chapter files constitute a veritable treasure trove of mathematics club program suggestions.

Students who gain the most from school mathematics clubs very likely are those who put the most into them--their organization, their activities, their competitions. Such students tend to be present in disproportionate numbers at Mu Alpha Theta national conventions. As a speaker, Log editor, and fellow-participant on such occasions, I've been privileged to live an interact with (over the years) several

thousand such students. For me, such observation effectively shatters any stereotype as to the mathematically active and able among today's youth. Genuine love of mathematics, high competitive spirit, uncommon tenacity, and keen and articulate alertness need not over-ride or preclude good fellowship or the natural desire for a good time. Skipping a Disneyland excursion to "bone up" for Math Bowl competition is frowned upon, and anything but the rule!

As Mathematical Log editor, I have received and saved hundreds of letters from sponsors and students, and gained further useful insight into the kind of challenge that captures the imagination of the more able. Perhaps because they are relaxed with mathematics, these students can genuinely enjoy playing with it. Challenge them (as one instance) to represent 49 with four 3's and elementary mathematical operations through factorial (which is difficult), and they'll find a way; ask for 65 (which, with suitable restrictions, may well be impossible), and they'll try the harder, and be the better for it. I encourage these students to browse in the mathematics and science sections of school and community libraries, and in bookstores. Recreational Mathematics, Theory of Numbers, and Introductory Combinatorics are, with Problem Solving, recommended headings. I refer them to old Scientific Americans (often available secondhand), for general reading and for the fine expository writing of Martin Gardner in his section, "Mathematical Games"; to The Journal of Recreational Mathematics; to School Science and Mathematics for its splendid "Problems" section; to Games and Four-Star Puzzler, for novel and imaginative competitions frequently having a logical or mathematical foundation; and to the many Dover Publications paperbacks in mathematics and the sciences. Theory of Numbers is, of course, unique both in the richness of its history and its ability to pose deep, challenging questions--some unsolved--in language that a child can understand.

The secondary school mathematics club, as evolved in the North American context, can offer something extra and worthwhile for virtually all students, but is of special significance to the ablest. Coffield, in a recent Mathematics Teacher contribution, particularly well summarizes advantages to the faculty sponsor, commonly the key person in club operation, and benefits to the student.

The school mathematics club sponsor, Coffield points out, can:

--enjoy discussing mathematics without the concerns of classroom management;
--get to know some students better;
--see students in a different and relaxed setting;
--try out a novel lesson that might be used with a regular class;
--see students grow mathematically;
--refresh some little-used advanced mathematics skills.

The student who takes part in mathematics club activity should in turn, gain the opportunity to:

--share ideas and experiences in mathematics;
--solve problems in groups;
--mingle with students of different ages;
--demonstrate leadership qualities;
--express an interest in mathematics without dealing with negative peer pressure.

"One of the best methods of combining honour with opportunity for superior pupils in mathematics." This is as good a characterization and appraisal of the secondary school and junior college mathematics club (and, by extension, of Mu Alpha Theta) today as it was of the formative local club of fifty years ago (Shoesmith, 1933, p. 30). Indeed, after 25 years of intensive leadership and coordination from Mu Alpha Theta and the mathematics and mathematics education communities, the North American record of extracurricular mathematics--the clubs, meets, fairs, contests, and conventions--in identifying, challenging, and giving recognition and support to the mathematically ablest--though less widely appreciated than it should be--is, we submit, indeed impressive.

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